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DEPOSIT FROM TINCTURA SANGUINARIÆ.

By Frederick Krauss.

It is a well-known fact that tincture of sanguinaria, U. S. P., when kept for a few weeks, deposits on the sides of the containers, a reddish film of what seems to be a resin. No variation of the menstruum seems to prevent this. It does not interfere with the clearness of the tincture, but merely gives the shop bottle a bad appearance, after a quantity of the tincture has been taken out in the routine of business.

It can readily be removed with a solution of NaOH or of KOH. Ammonia has but little effect upon it. The fixed alkali liquids dissolve only a small proportion of the deposits, the remainder being removed in the state of insoluble powder.

I removed a quantity of this resin from several bottles with the aid of solution of NaOH. Throwing the mixture upon a plain, white filter, I washed it first with water (in which the powder is entirely insoluble), then with water containing a small quantity of HCl. Finally, it was again washed with pure water until washings gave no reaction to test-solution of $AgNO_3$. The residue was then allowed to dry.

It forms a reddish-black, somewhat glistening, resinous powder, very slightly soluble in ether and alcohol. It is more soluble in chloroform and spirit of chloroform, the former making a deep red solution, whereas the latter made a light red solution. The chloroform is of course the solvent in both cases. The resin is insoluble in benzin, burns without melting with a bright white light, and

leaves a black residue. It is also insoluble in HCl, completely soluble, however, in concentrated H_2SO_4, forming a very dark red solution from which the resin is entirely precipitated as a flocculent, red powder, on the further addition of a quantity of water. On allowing the liquid to stand, the resin rises to the top, leaving the colorless solution at the bottom. When shaken up, the mixture has much the appearance that is produced when Tr. Cinchon. Comp., U. S. P., '80, is mixed with water.

The resin is also soluble in HNO_3, from which it is only partially precipitated on the addition of water. After allowing it to stand, the underlying liquid was still highly colored, in which it differed from that of former test.

For an examination of the precipitate in tincture of sanguinaria, see also paper by F. L. Slocum in Amer. Jour. Phar., 1881, p. 277.

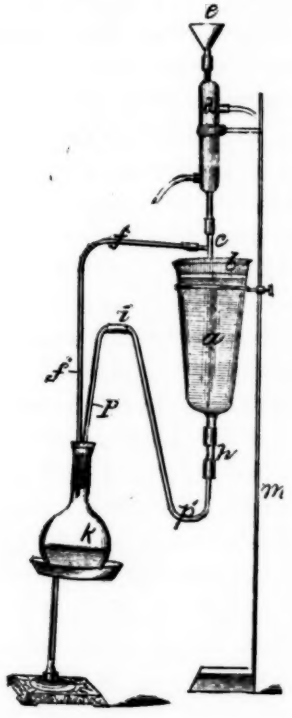
GOMBERG'S EXTRACTION APPARATUS.

By Harry Kahn, Ph. M.

This apparatus which is for the continuous extraction of comparatively large quantities of drug, was constructed by Moses Gomberg, B. Sc., Assistant in Organic Chemistry in the University of Michigan, in the chemical laboratory of which institution it has been in almost constant use for the last three years.

It consists of an ordinary conical glass percolator *a*, of about two litres capacity; the upper opening is fitted with a circular piece of board *b*, which is about 2·54 cm. thick, and after it has been covered with chamois-skin or other suitable material, should fit tightly into the percolator. In the centre of the board *b* is a hole to admit a rubber stopper through which one arm of the T-tube *c* is inserted, the upper arm being connected by means of rubber tubing to an upright Liebig's condenser *d*, to the upper end of which is attached, by means of rubber tubing, a small funnel *e* to facilitate the addition of menstruum. The other arm of the T-tube *c* is connected by means of rubber tubing to the hard glass tube *f and f'*, which is about 1 cm. inside diameter, and is so bent that *f* is 25 cm. long and *f'* 45 cm. To the lower opening of the percolator is attached, by means of rubber tubing, a short piece of combustion tubing *h*, which is drawn out to allow a piece of hardglass tubing *p* and *p'*, 1 cm. internal diameter, to be attached. The tube *p* and *p'* is bent so as to form a syphon

the upper bend being a little below the level of the powder in the percolator. p' from the connection with the combustion tubing h to the second turn i, is 35 cm.; the remainder p, 25 cm., should run parallel with f', and both p and f' are fitted into a two-holed stopper, which in turn is fitted into a florentine flask k of one liter capacity. The whole apparatus is supported by a high retort stand m, the percolator by a large ring, and the condenser by a condenser clamp. The flask k is supported by a small retort stand fitted with



a suitable ring. The syphon p and p' may consist of two sections, joined by a piece of rubber tubing at i. The use of the apparatus is readily understood from the above.

DETROIT, MICH., August, 1891.

Suppositories of Glycerin.—Soak for two or three hours gelatin 20 gm. in distilled water 45 gm.; then melt the mixture in a water bath, add glycerin 165 gm., and pour into suitable moulds; roll the suppositories in prepared chalk. —*Pet. Mon. de la Phar.*, June.

SOME PLANT CONSTITUENTS.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy. No. 94.

ASMINA TRILOBA (*Papaw*).—Thomas M. Fletcher examined the bark of this tree which in the extreme Southern States reaches a height of 30 to 40 feet. Further north it is a shrub and does not often exceed 10 to 12 feet in height.

The fruit is in bunches of two to six in each. When in an unripe state the fruit has a green color, breaking with a short fracture. The ripe fruit is of a light yellow color, nearly cylindrical, about five inches in length and one and a half to two inches in diameter, slightly curved, containing a pulpy mass with thirteen to fifteen carpels, each containing a seed with a dark brown hard and brittle testa. The fruit ripens in September, after having been exposed to the frost. It has a sweetish taste resembling the banana, and is highly esteemed by the negroes. The woody portion of the tree is white, very light in weight and enclosed by a dark brown bark, which in older trees becomes an ashen color. The inner bark is of a tough fibrous texture, white in color when first collected, but becoming gradually darker by exposure.

Lloyd[1] found an alkaloid in the seeds and a bitter extractive in the bark. No evidence of the alkaloid was found in the bark by Mr. Fletcher, although various tests were applied to detect one. Petroleum ether dissolved 3·53 per cent. from the finely powdered bark which consisted of a fixed oil.

The most important constituents found by other solvents were 3·43 per cent. of resin, 9·50 per cent. of resin insoluble in ether, but soluble in absolute alcohol, and 8·00 per cent. of glucose and extractive soluble in distilled water. There were also determined 52·16 per cent. of woody fibre, 7·38 per cent. of moisture and 4·20 per cent. of ash.

POLYGONUM BISTORTA.—Paul Krebs determined the following constituents in bistort root: Tannin 15·00 per cent., fat and wax 0·10 per cent., resin 0·30 per cent., mucilage 1·32 per cent., dextrin 1·92 per cent., glucose 4·88 per cent., albuminoids 1·78 per cent., and insoluble matter consisting of incrusting substances, lignin and cellulose 47·06 per cent. There were also found moisture 9·20 and ash 4·80

[1] Drugs and Medicines of North America, **2**, 54.

per cent. Caoutchouc, gallic acid, coloring matter and starch were detected but not estimated. Bowman in 1869 found 20 per cent. of tannin, and other investigators have reported the presence of tannin, gallic acid, starch and mucilage.

CALENDULA OFFICINALIS.—Maxwell J. Tielke states that this drug is used considerably in parts of our western country as a vulnerary.

The following percentages were found:

Volatile oil,	·02
Fixed oil,	5·30
Caoutchouc,	4.90
Resin and coloring matter,	8·71
Mucilage,	6·30
Sugar,	11·82
Albuminoids,	1·32
Pararabin,	·88
Insoluble lignin, etc.,	39·22
Ash,	10·50
Moisture,	6·75
Undetermined and loss,	4·28
	100·00

The activity of the drug is probably due to the yellow resin dissolved by ether and alcohol. Tannin was not found, although the coloring matter was somewhat darkened by solution of ferric chloride.

PENNYROYAL AND ITS VOLATILE OIL.

BY WILLIAM A. HAGUE, PH.G.

From an inaugural essay presented to the Philadelphia College of Pharmacy.

The following notes are compiled from the author's observations and from information obtained during the summer of 1890 from those who gather large quantities of pennyroyal for the purpose of distilling the oil. The herb grows very abundantly near my home in Belmont County, O., and also in the adjoining counties; in fact, so much of it grows in that section that each summer reunions are held known as the "pennyroyal reunion." The herb grows spontaneously, principally in old fields and dry waste places. It is one of the few herbs not subject to cultivation; it will not grow from the seed nor can it be reproduced by transplanting. A field may one season be completely covered with the herb and without disturbing the ground there may not be a single plant in the same field the

next year.[1] And a field that produced not a plant one year may be covered with pennyroyal the next.

The plant grows to the height of from 10 to 15 inches and has a strong odor of the oil. It is found on almost all kinds of soil, from the richest to the most barren fields, and during extremely dry seasons when most other vegetation is dried up, it apparently thrives as well as if there had been plenty of rain. It is claimed that, if there is too much rain, the plant does not yield as large a percentage of oil as in moderately dry seasons, nor oil of as good quality. Pennyroyal does not grow in shaded, nor very damp places, but always in open fields and in newly-cleared grounds.

The herb is gathered principally for the oil it contains, although a large quantity is collected each summer by people living in the neighborhood where it grows, for the purpose of using it during the following winter, the hot infusion being employed as a stimulant for flatulent colic and for colds by promoting perspiration, and for other complaints. It blossoms in August and is gathered then, as it yields the largest amount and best quality of oil when in bloom. Where it grows thickly it is mown and if scattered it is pulled by hand.

The apparatus used for distilling the oil is generally of the simplest construction, mostly "home made," and made portable so that when the crop of one locality is exhausted, the apparatus can easily be moved to another place. A steam-tight tub or tank is made of wood 2 inches thick and large enough to hold about 500 pounds of the herb. After it has been spread upon the ground to partly dry, the herb is packed in the tub by tramping, until this is filled, when it is covered by a closely-fitting lid. Into the bottom of the tub steam is admitted from a boiler, through a 2-inch pipe, and the mixed vapors of oil and water are allowed to escape through another pipe leading to the condenser. This usually consists of a pipe of tin or copper, which passes through a cistern of

[1] The last two sentences are almost identical with statements made in a paper by Mr. J. F. Patton, published in "Proceedings Penna. Phar. Assoc.," 1890, p. 88. The information was, probably, in both cases obtained from Guernsey County, which adjoins Belmont County. The plant being an annual must obviously be reproduced from the seeds; but it is possible that the hard seed-like akenes may sometimes remain in the ground for several years before germinating.—EDITOR.

water, or if a cistern cannot be had, a barrel is used through which a stream of water continually flows. The condensed water and oil are collected in a peculiarly-constructed receiver known as a "divider." This divider consists of two vessels, made of tin or copper, of convenient size, one fitting inside the other and projecting about an inch above the top of the outer one. The smaller vessel, provided with a hole in the bottom, receives the mixed water and oil; the former being the heavier, sinks to the bottom and passes through the hole into the outer vessel. As the distillation proceeds, the water rises in the outer vessel until it flows over the top while the oil remains in the smaller one. From this it can be easily removed by dipping it out. After filtering, the oil is ready for the market.

The yield of oil varies from 0·5 to 1·5 per cent., depending on the season and condition of the herb when gathered. The freshly-distilled oil is colorless, but becomes yellow and viscid upon exposure to the atmosphere and light.

THE CULTURE OF FLOWERS AND THE PRODUCTION OF PERFUMES IN THE RIVIERA.

The perfumes produced in Nice are of a very high standard. One of the most important processes is the distillation for the production of essences.

So far as the process of distillation itself is concerned: A copper vessel is filled two-thirds with water; then the desired flowers are thrown in, the vessel is tightly closed and placed on the fire. In this manner, steam is engendered in the vessel, and is conducted by a tube through a cylinder, which is constantly filled with cold water and is supplied with an overflow cock. In this cylinder the tube is bent spirally, and ends in a faucet at the bottom, from which the volatile essence drops, after the condensation of the steam. The essence is collected in a small glass vessel, while at the same time, the water takes up a small portion of the perfume, and is then disposed of as rose-water or orangeflower-water. It is not feasible to submit all flowers to this process: such as yield no essence, like jasmin, cassie-flowers, tuberoses, etc., must be treated in a different manner.

Among the flowers which contain essences, those of the orange

tree yield but one gm. of essence for every kg. of blossoms. This essence is the "Neroli" of commerce, and is the principal product in the district between the department of Var and the Italian boundary line. The following table shows the yield of essence of the various kinds of flowers, roots and wood:

Neroli flowers,	1,000 kg.	yield	1·0 kg.	essence.
Roses,	25,000 kg.	"	1·0 kg.	"
Geranium,	1,000 kg.	"	1·0 kg.	"
Mint,	1,000 kg.	"	0·75 kg.	"
Orange leaves,	1,000 kg.	"	1·0 kg.	"
Lavender,	100 kg.	"	0·5 kg.	"
Eucalyptus,	100 kg.	"	0·5 kg.	"
Cherry laurel,	1,500 kg.	"	1·0 kg.	"
Rosemary,	200 kg.	"	1·0 kg.	"
Spike,	120 kg.	"	1·0 kg.	"
Cedar,	40 kg.	"	1.0 kg.	"
Dried Patchouli leaves,	40 kg.	"	1·0 kg.	"

The volatile essences produced by the above process are mixed with alcohol and thus utilized as cologne, toilet vinegar, lavender water, etc.

Mignonette, tuberose, jasmin, cassie-flowers, violet and jonquil contain no ethereal oil, as has already been mentioned; these flowers are used for the manufacture of pomades, from which afterwards alcoholic preparations, extracts or infusions, such as the toilet perfumes of the retail trade, are produced. There are two processes to which these flowers may be submitted, the "cold" and the "hot" process. The cold process is generally used for cassie (*Acacia Farnesiana*), jasmin, tuberoses, violets, jonquil and several other varieties. The freshly-gathered flowers are spread on a ¼-inch layer of pure lard, which has been placed on a glass plate with wooden frame. Forty to fifty of these frames are placed one above the other, and the flowers, according to the variety under manipulation, changed every 12–48 hours, until the lard is sufficiently perfumed, when it is packed in air-tight containers and ready for commerce.

In the hot process, 20 kg. of fat and about 5 kg. of flowers are placed in a copper container and heated slowly with constant stirring. After heating for about ten minutes, the vessel is allowed to cool, and then 5 kg. of flowers are again added; this is repeated until the fat is sufficiently impregnated with the perfume. The hot fluid is then strained and the remaining fatty mass submitted to hydraulic pressure.

The pomades resulting from both these processes, are used for the production of the so-called "extracts," which are obtained by means of spirit of wine; and from the various mixtures and compounds of these extracts result the different sorts of perfumes. Certain perfumes are only extractable from various fruits, flowers and roots by fermentation by means of alcohol; for instance, benzoin, tonka, iris, etc.

The largest perfume manufactories are found in Grasse, Nice and Monaco. The total production of flowers and blossoms for the District of the Sea-Alps is calculated to be for:

Orange-blossoms, .	1,860,000 kg.	Tuberoses, ...	74,000 kg.
Roses, ...	1,000,000 kg.	Jonquil, ...	50,000 kg.
Violets, ...	157,000 kg.	Cassie, ...	30,000 kg.
Jasmin, ...	147,000 kg.	Mignonette, ...	20,000 kg.

At Grasse, poor olive crops and the subsequent improvement of the irrigation facilities have led to the extension of flower culture and essence manufacture. Plantations of jasmin, tuberoses and roses have in many cases taken the place of the olive groves, so that, with the exception of orange-blossoms and cassie, Grasse and the surrounding districts produce as high as four-fifths of the above-named quantities of flowers, and of jonquil and mignonette almost the entire quantity. The mountain sides north of Grasse yield rosemary, lavender, thyme and spike in large quantities.

The prices of the different flowers, etc., varied during the years 1884–88, as follows:

Orange blossoms (neroli),	from	0·30	Francs	to 0·50	Francs	for 1 kg.
" " bitter,	"	0·70	"	1·60	"	1 kg.
Roses,	"	0·50	"	0·80	"	1 kg.
Jasmin,	"	2·50	"	2·75	"	1 kg.
Tuberoses,	"	2	"	4	"	1 kg.
Violets,	"	2	"	5·25	"	1 kg.
Cassie (*Acacia Farnesiana*),	"	7	"	17	"	1 kg.
Geranium,	"	5	"	10	"	100 kg.
Orange leaves, sweet,	"	3	"	6	"	100 kg.
Lemon leaves, bitter,	"	12	"	15	"	100 kg.
Cherry laurel,	"	8	"	12	"	100 kg.
Thyme,	"	8	"	11	"	100 kg.
Lavender,	"	7	"	12	"	100 kg.
Mint,	"	10	"	14	"	100 kg.
Rosemary,	"	4	"	5·50	"	100 kg.
Spike,	"	4	"	5·50	"	100 kg.

What importance, beside the use for perfume purposes, the trade of *fresh* flowers has obtained, may be seen from the fact that during the time extending from November 1, 1887, to the end of May, 1888, there were shipped, from the station at Cannes alone, 369·096 kg. of fresh flowers, with a value of 1,858,325 Frcs., while for the season 1888–89 it reached a value of 2,855,475 Francs, or an increase of 997,150 Frcs. over the previous year.

Translated from *Gartenflora*, Sept. 1, 1891. M. A. M.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Linamarin, a glucoside yielding hydrocyanic acid present in the embryo of flaxseed, has been isolated by A. Jorissen and E. Hairs; it resembles amygdalin by yielding sugar and hydrocyanic acid in its decomposition by mineral acids and flaxseed-meal emulsions. Linamarin forms colorless needles crystallizing in groups, having a cooling and very bitter taste; ultimate analysis gives the following composition: C 47·88 per cent., H 6·68 per cent., N 5·55 per cent., O 39·89 per cent. The following points of difference are noted between linamarin and amygdalin: *Amygdalin* is soluble in twelve parts of water; by heating to 120° C. it loses water and melts with decomposition at 200° C.; concentrated sulphuric acid imparts a beautiful violet coloration; it contains 52·51 per cent. carbon and 3·06 per cent. nitrogen; amygdalin is decomposed by an emulsion of *sweet almonds*, also by an emulsion of *flaxseed-meal*; benzaldehyde is one of its decomposition products. *Linamarin* is soluble in an equal weight of water; by heating to 120° C. no water is eliminated, it melts at 134° C. and can be heated to 150° without decomposition; it is not colored by concentrated sulphuric acid; it contains less carbon and more nitrogen; linamarin is decomposed by an emulsion of *flaxseed-meal* but *not* by an emulsion of *sweet almonds;* benzaldehyde cannot be found among the decomposition products. —(Jour. de Pharm. d'Anvers.) Pharm. Post, 1891, 659.

Cod-liver oil emulsion.—Instead of the usual method of preparation with acacia, P. van Aspern recommends the use of a 20 per cent. solution of potash soap by which means it is possible to prepare an emulsion containing 80 per cent. of oil; the emulsion is stated to be

tasteless if taken in milk or warm coffee; if necessary, syrups, creasote or flavoring substances may be added.

Castor oil emulsion. Potash soap 2·0 dissolved in distilled water 10·0 and mixed with castor oil 40 0; flavor by addition of six drops of oil of peppermint.

Volatile oil emulsions may be easily prepared by the use of soap.

Oil of turpentine emulsion.—Potash soap solution (10 per cent.) 40·0, oil of turpentine 50·0; this emulsion separates no oil upon dilution with water.—Apotheker Ztg., 1891, 471.

Detection of quinine in presence of phenacetine.—The latter substance prevents the fluorescence of quinine sulphate, especially in dilute solutions; with chlorine water and ammonia phenacetine produces a yellowish-violet coloration, a mixture of quinine and phenacetine with these reagents producing a fine blue color. To obtain the thalleioquin test, best results are obtained with bromine-vapor: Bromine-vapor is allowed to act upon the solution until a faint turbidity results, then ammonia is added, drop by drop; proceeding in this manner the green coloration appears, although darker and inclined towards a violet; if the test be now agitated with ether and allowed to stand a while, the ethereal layer will be colored yellowish-violet and the aqueous layer green.—Sestini and Campani, Pharm. Ztg., 1891, 494.

Antiseptin.—After the exposure of *Somnal* (claimed to be "ethylated chloral-urethane," but found to be a mixture of alcohol, chloralhydrate and urethane) and *Antinervine* (called "Salicyl-bromanilide," indicating a definite chemical compound of bromacetanilide and salicylanilide, but by analysis found to be a mixture of salicylic acid, acetanilide and ammonium bromide. See Am. Jour. Pharm., 1891, 408). Dr. F. Goldmann publishes an analysis of the third of Radlauer's productions, *Antiseptin* or as it is also designated "zincum boro-thymolicum jodatum." It was found to vary slightly in composition, but the average analysis indicated *zinc sulphate*, 85·0, *zinc iodide*, 2·5, *thymol*, 2·5, and *boric acid*, 10·0.—Pharm. Ztg., 1891, 494.

Alkaloids of the areca-nut.—Of the three alkaloids present two, arecoline and arecaine, have been described at length in the Am. Journ. of Pharm., 1889, 133 and 193; the third, *aracaidine*, $C_7 H_{11} NO_2 H_2O$, isomeric with arecaine, is present to the extent of 0·1 per cent.; it forms colorless, permanent, tabular crystals, and is easily

soluble in water and dilute alcohol, but almost insoluble in absolute alcohol, ether, chloroform and benzol; it loses its water of crystallization at 100° C., and melts, attended with frothing, at 222–223° C; it forms crystallizable salts and is precipitated by platinic and auric chlorides (arecaidine platinochloride melts at 208–209°, arecaine platinochloride at 213–214°; arecaidine aurochloride at 197–198°; arecaine aurochloride at 186–187°). Arecoline is methyl-arecaidine, and it has been possible to convert one into the other; ethyl-arecaidine, called *homarecoline* $C_9H_{15}NO_2$ has also been made and, like arecoline, is poisonous, whereas, arecaidine is not poisonous.—E. Jahns (Ber. d. D. Chem. Ges.), Pharm. Ztg., 1891, 516.

To prevent bumping in boiling liquids a piece of glass tubing 5–8 cm. (2–3 inches) long and 5–10 mm. ($\frac{3}{16}$–$\frac{3}{8}$ inch) diameter is closed at one end, and in this end a piece of platinum wire is fused; the wire should be long enough to extend above the liquid; the open end of the tube is to be placed down in the liquid. During ebullition the air in the tube is displaced and on cooling the tube fills with the liquid; before each operation the tube must be freed from liquid so that it is full of air when introduced into the liquid to be boiled or distilled. This device answers admirably in the distillation of volatile liquids, also in boiling liquids holding fine powders in suspension, like barium sulphate, etc.; likewise in the estimation of volatile fatty acids in butter analysis.—Dr. E. Pieszczek, Chemiker Ztg., 1891, 1126.

Iodine-absorption of fixed oils.—To determine the most reliable method of conducting this analytical operation, Dr. Holde carefully investigated the several conditions necessary, and as the result publishes the following procedure: Of non-drying oils 0·3 gram and of drying oils 0·2 gram are taken and dissolved in 18–20 cc. chloroform in a flask of about 300 cc. capacity; to the non-drying oil 50 cc. iodine solution (which must not be more than 2 weeks old) are added, to the drying oil 60 cc. of an iodine solution (which must be less than 8 days old) are added. Two determinations of each oil should be made and the absorption allowed to proceed for two hours. Two blank tests must be made, the mean of the two giving the value of the iodine solution; the first one is made by titrating at once 50 cc. of the iodine solution with the sodium thiosulphate solution after adding 40 cc. 10 per cent. potassium iodide solution, using starch solution as the indicator; in the second one the iodine

solution is allowed to stand for two hours before titrating. After allowing the tests to stand two hours, 40 or 50 cc. (10 per cent.) potassium iodide solution (the latter quantity for drying oils) and 120 cc. water added and the excess of iodine titrated with the sodium thiosulphate solution. Should the chloroform solution of the oil become cloudy during the two hours, more chloroform must be added. Working after this method the following iodine-absorptions were obtained: Linseed oil, 172–180; hempseed oil, 175–176; poppyseed oil, 139–143; sesame oil, 106–109; cotton-seed oil, 110–115; crude rape oil, 100–108; refined rape oil, 100–107; arachis oil, 91·2–101·5; olive oil, 79–84 (88); bone oil, 59·1–81·7. It is worthy of attention that the drying oils by this procedure give much higher figures than those published by Hübl; in the case of linseed oil Hübl gave 156–160; the difference is caused by using a very considerable excess of iodine from the beginning, thus insuring a more complete absorption.—Chemisches Repert., 1891, 228.

CONSTITUENTS OF RHIZOMA PODOPHYLLI.[1]

By R. Kürsten.

The results of the present investigation supplement the work done by Podwyssotzki (1882). The podophyllotoxin prepared by Podwyssotzki's method was not constant in composition, and its melting point varied from 100° to 125°; further, the podophyllic acid of that author is composed mainly of a crystallizable, active, but very impure substance.

Podophyllotoxin, $C_{23}H_{24}O_9 + 2H_2O$, is obtained by extracting the coarsely powdered rhizome with cold light petroleum, until freed from fat; after drying in the air, the extraction is continued with chloroform, until the liquid comes away almost free from yellow color. As it is not possible to work with alcohol-free chloroform, too prolonged extraction with chloroform would yield a more impure extract. The chloroform extract is distilled, and the residue is dried over a not too warm water-bath, partially dissolved in benzene, filtered, and the filtrate allowed to remain from 3 to 8 days, when a brownish-yellow mass of well-formed, thick, strongly refractive prisms is produced, which is purified by washing with 50 per cent. alcohol, then with ether, recrystallizing first from boiling ben-

[1] *Arch. Pharm.* (1891), **229**, 220–248.; *Jour. Chem. Soc.*, Sept., p. 1133.

zene, and finally from solution in hot 45 per cent. alcohol. The compound is thus obtained in long, well-formed prisms. It melts at 93–95°, and at a higher temperature chars without subliming. 100 cc. of water at 15° dissolves 0·014 gram; hot water dissolves somewhat more. It is very slightly soluble in ether and cold benzene, easily soluble in acetone and strong alcohol, and with difficulty in concentrated acetic acid. When moistened with concentrated sulphuric acid the crystals give an immediate cherry-red coloration, which slowly passes through greenish-blue to violet. Concentrated hydrochloric and nitric acids produce a red coloration; ferric chloride and bromine produce no change; the compound dissolved in glacial acetic acid gives a red coloration with Millon's reagent. The alcoholic solution is strongly lævorotatory. Zeisel's method indicates the presence of three methoxyl groups. Hydroxyl does not appear to be present.

Podophyllotoxin, when oxidized in an alkaline solution in the cold, by means of potassium permanganate, yielded, besides a little carbonic anhydride and a brown, amorphous substance, principally two compounds, the more considerable of which was *podophyllic acid*, $C_{20}H_{24}O_9$, obtained as well-formed, colorless crystals, from solution in a mixture of benzene and alcohol. The compound is without action on animals. It melts at 158–160°. Its aqueous solution, neutralized with aqueous potash, gives no precipitate with gold, calcium or barium chlorides; silver nitrate gives a white precipitate, soluble in much water; copper acetate gives a blue precipitate. The *copper* salt $(C_{20}H_{23}O_9)Cu$, was prepared as beautiful, light-green prisms, and analyzed.

Picropodophyllin results from the action of alkalis on podophyllotoxin; thus, on heating the latter with aqueous ammonia, a well crystallized product is obtained, which at first was recrystallized from strong alcohol; but this was found to be unnecessary, as the melting point, 227°, was not affected by it. Picropodophyllin has the same composition as podophyllotoxin, but they differ in melting point: 227° and 95°; in their action on polarized light: inactive, lævorotatory; as to solubility, the former is less soluble in all liquids than the latter; the latter gives Millon's reaction, the former does not. By oxidation and reduction the two compounds yield the same products. The residue of the chloroform extract, freed from crystalline podophyllotoxin, yielded a little *picropodophyllic acid* in crystals melting

at 156–158°; no other definite substance could be obtained from the extract.

Podophylloquercetin, $C_{23}H_{16}O_{10}$, is best obtained from the rhizome, after extraction by light petroleum and chloroform, by further extracting with ether, distilling off the ether, and treating with cold glacial acetic acid. The crude crystals are purified by repeated recrystallization, best in an atmosphere of carbonic anhydride. It melts at 275–277°, is almost insoluble in water, sparingly soluble in cold glacial acetic acid, more soluble in the hot acid and in ether, easily soluble in strong alcohol. Alkaline copper solution is easily reduced when warm, also ammoniacal silver solution. Probably this compound is not identical with quercetin.

ON THE POISONOUS AND VERMIFUGE CONSTITUENT OF OLEORESIN OF MALE FERN.[1]

By E. Poulsson.

During the past ten years several cases in which poisonous symptoms, in a few instances ending in death, have been caused by oil of male fern. Poulsson has collected twelve, in four of which death took place. A drachm is the smallest dose which has given rise to symptoms of poisoning; on the other hand five to seven drachms have often been taken without evil results. The symptoms observed were vomiting, diarrhœa, cramps and drowsiness, which terminated in coma; in two cases there were somnolence and muscular contractions, assuming in one the form of trismus. In many of the cases which Poulsson has brought together the symptoms have been imperfectly recorded, but it appears that the drug is capable of giving rise (1) to irritation of the stomach and intestines; (2) to paresis and irritation of the central nervous system, and that death may be caused by the influence of the drug on the nervous system.

The active constituents of the male fern root on which its therapeutic value depends, and which are capable of giving rise to poisonous symptoms, have not been hitherto absolutely determined; the extract has been found to deposit crystals of filicic acid; the

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[1] Ueber den giftigen und bandwurmtreibenden Bestandtheil des ätherischen Filixextracts.—*Archiv f. Exp. Patholog. u. Pharmak.*, 29, p. 7; from The Medical Chronicle, September, 1891.

composition of this substance has been variously given (Luck, $C_{26}H_{30}O_9$, and Grabowski, $C_{14}H_{18}O_5$); the latter points out that by decomposition with a caustic alkali butyric acid and phloroglucin are produced, and regards it as a dibutyrylphloroglucin; the former was subsequently inclined to regard it as an anhydride, since in several of its compounds, as, for instance, its lead salt, an additional atom of water is included. In addition to filicic acid, the ethereal extract of male fern contains a volatile oil, resin, and other principles, and some doubt has arisen whether the activity of the root does not in part depend on these; for it has been noticed that the crystalline filicic acid does not always seem to possess very active properties.

Carlblom found it sometimes acted as an anthelmintic, sometimes it was without effect, and another observer, Rulle, noted that when he gave an impure filicic acid, made by simply treating the extract with ammonia and then precipitating the filicin by hydrochloric acid, he obtained an active anthelmintic, but when he purified and crystallized the filicic acid in the precipitate it seemed to have no effect.

Poulsson's investigations explain this apparent anomaly. He, too, finds that the impure precipitated filicic acid is an active poison to rabbits, but the crystalline filicic acid does not produce toxic symptoms in a rabbit even in doses of twenty-two grains. He finds, however, that if the pure filicic acid is dissolved in an alkali and precipitated by an acid the amorphous precipitate obtained is a poison acting like the liquid extract. His investigations have led him to the conclusion that the amorphous substance is the true filicic acid, and that it has the composition $C_{35}H_{42}O_{13}$. The crystalline substance hitherto known as filicic acid is the anhydride of filicic acid ($C_{35}H_{40}O_{12}$) and he proposes to call it *fiilicin.*

Filicin crystallizes in small yellow rhombic plates, is insoluble in water and quite insoluble in cold alcohol, but dissolves in boiling alcohol. It is more or less soluble in ether, amyl-alcohol, benzol, chloroform, and fat oils. In alkalies in the cold it is only soluble in considerable excess of the solvent. It melts at 184·5°.

Filicic acid is an amorphous white powder without taste or smell. It is soluble in the same solvents as the anhydride, but more readily, and it is especially soluble in cold alcohol; it is very easily soluble in alkalies and olive oil. At 100° it becomes of a straw yellow

color, but is not decomposed; it melts at 125°. Filicic acid is easily transformed into the anhydride. If a concentrated ethereal solution be boiled crystals of the anhydride are precipitated, and in a few days a further quantity falls down.

Poulsson has investigated the pharmacological action of filicic acid on the skeletal muscles, on the heart, and on the nervous system. In the frog (Rana temporaria) a weak alkaline solution injected subcutaneously caused ejection of the contents of the stomach and intestines, motor paresis, twitching of the muscles, and irregular action of the heart, which tends to distension in diastole and eventual cessation of the beat. Twitching did not occur after curare or section of the sciatic nerve. Six to seven mg. cause death in one-half to three-quarters of an hour; two mg. in about twelve hours. R. esculenta are not so easily affected. The paralysis produced by filicic acid is central in origin, for the muscles react to the induced current as well after as before the poisoning, and even after death from filicic acid they contract well to the faradic current. The muscle curve is not much altered, nevertheless Poulsson's experiments show that the elasticity and capacity of work of the muscle is decreased, and, therefore, the filicic acid is a muscle poison. Poulsson is of opinion that filicic acid depresses the heart's action in the frog partly owing to its action on the muscle, and partly owing to its influence on the automatic ganglia. It decreases the strength of the beat, and causes arrest in diastole. The local application of atropine will, under some conditions, excite contractions again.

The intravenous injection of one decigramme in a rabbit causes marked muscular relaxation owing to spinal paresis, but soon increased reflex excitability is noticed, later on twitching, and sometimes tetanus. The heart beats after the respiratory muscles cease to act, yet artificial respiration will not prolong life.

Given by the stomach 7½ grains is a fatal dose. It is, however, so slowly absorbed from the intestine that from 12 to 20 hours the animal may remain well. Then weakness of the hinder extremities comes on, and symptoms follow similar to those described as the effect of injection. Death occurs in 24 to 48 hours. The action is more rapid if filicic acid is given in oil. Fern extract produces the same effects as filicic acid.

After death the mucous membrane of the stomach and intestines is found turgid and hyperæmic—even after subcutaneous injection

there is slight fulness of the vessels, and swelling of the mucous membrane. In the urine a trace of albumen is sometimes found, and at times there is a constituent present which is capable of reducing copper.

Poulsson says that filicin does not give rise to symptoms of poisoning even in doses of 1 grm. to 1½ grm. Occasionally a little diarrhœa occurs, perhaps owing to a little filicic acid being formed. Its inertness is, perhaps, due to its insolubility. If given with alkalies it is converted into the active filicic acid.

Filicic acid is soluble in the intestinal contents, but with difficulty absorbed, hence it kills and drives out parasites without injuring the organism. Poulsson's experiments seem to show that it is the essential active principle, and it seems probable that we may be able to employ filicic acid instead of the extract, a manifest advantage, because it is not disagreeable whilst the extract is very nauseous.

ESTIMATION OF TANNIN IN HOPS.[1]

By E. Kokosinsk.

The method depends on the property of tannin of absorbing iodine in presence of alkaline carbonates.

The solution is prepared by boiling 10 grams of hops, the solution being diluted to 500 cc. If the hops have been sulphured, a few drops of hydrogen peroxide are added to the water before commencing to boil. The extract is filtered from the hops. The solutions required are: (1) normal solution of sodium carbonate; (2) normal sulphuric acid; (3) $\frac{1}{50}$ N. iodine; (4) $\frac{4}{50}$ N. solution of sodium thiosulphate 9 920 gram in 1 litre; (5) a solution of pure tannin prepared from galls which contains 0·05 gram tannin in 100 cc.; (6) a freshly prepared solution of starch.

Three flasks of about 100 cc. capacity are employed; into the first is put 10 cc. of water, into the second 10 cc. of the tannin solution, into the third 10 cc. of the hop extract. To each flask 4 cc. of the normal sodium carbonate solution is added, and immediately afterwards 20 cc. of the standard iodine solution. Flasks 2 and 3 are then tested for free iodine by placing a drop of the solution on a piece of starch paper, and if free iodine is not present, more of

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[1] *Chem. Centr.*, 1891, **1**, 377; *Jour. Chem. Society*, July, p. 870.

the standard iodine must be added to each flask. The iodine is allowed to react for five minutes, then to each flask 4 cc. of the normal sulphuric acid is added to neutralize the sodium carbonate, and 10 cc. of the sodium thiosulphate solution is added to reduce the excess of iodine present. A few drops of starch paste are now added to each flask, and the excess of thiosulphate determined with the iodine solution. The number of cc. of iodine required to titrate the thiosulphate in flask 1 represents the amount of iodine which has entered into combination with the sodium carbonate, the starch, and other errors which may be inherent to the titration; the amount of iodine used by flask 2 represents that absorbed by the solution of tannin = 0·005 gram plus the amount absorbed in the blank experiment; the iodine used by flask 3 represents that which was absorbed by the tannin of the hops *plus* the amount absorbed in the blank experiment. From these figures, the amount of tannin in the hops may be readily calculated.

COPPER IN PRESERVED VEGETABLES.

At the meeting of the Bavarian Society of Applied Chemistry, held last month in Augsburg, the subject of the presence of copper in preserved vegetables was the subject of a long discussion, which is epitomized in the *Chemiker Zeitung*, as follows:

The discussion was preceded by a paper from Herr Mayrhofer, of Mayence, in which the author stated as the result of his experience that in nearly all preserved vegetables copper is present, sometimes derived from the vessels used in their preparation, sometimes added directly in the form of sulphate. In the case of fruits boiled with sugar the juice contains on an average 4 to 9 milligrams of copper to the kilogram of juice, derived entirely from the copper vessels, which are found in practice to be better suited for boiling products of this kind than vessels of any other material. The green preserves met with in commerce vary in the amount of copper they contain between 26 and 36 milligrams per kilogram; in once case 76 milligrams per kilogram was found. In these green preserves the copper is partly derived from copper vessels and partly added as sulphate. Preserves of this kind show after heating and sterilizing a green color, comparable to that of the fresh vegetable, whilst without the copper they take a brownish or yellowish color that

makes them unmarketable. The author expressed the opinion that preserves of this kind containing copper can be eaten without injury to health. He stated that he had found by experiment 20 to 24 milligrams of copper sufficient to give the desired green color to a kilogram of preserves. He therefore recommended that this quantity of copper should be considered allowable and unobjectionable for the coloring of preserves.

Med. R. Karsch (Speyer) stated that what was done in Germany was based upon the practical experience of France, and he thought the same limits might be set up there as in that country.

Herr Barth (Rufach) mentioned a case in Brunswick in which a preserve manufacturer had been acquitted on the basis of a medical opinion. The question involved in the use of copper salts was not one of dressing up decayed food material, but of imparting a color. In the case of some preserves, peas for instance, a vegetable pigment can be used in the place of a copper salt, but in others, such as beans, it could not.

Herr Barth communicated some experiments made with wine, containing copper which had been derived from the compounds used as dressing against *Peronospora.* Cows were given up to 8 grams of sulphate of copper daily without any injurious effects being observed.

Med. R. Merkel (Nuremberg) uttered a warning against the results of such experiments on animals being applied to men. It was, however, a fact that the cases of chronic copper poisoning recorded in forensic literature could not support strong criticism; but, on the other hand, it could not be said that there was no danger. Chronic copper poisoning occurring among workers in copper and bronze had not yet come to his knowledge. In his opinion the meeting was not yet in a position to come to a decision upon the question.

Herr Kayser (Nuremberg) also argued against going to the extreme on the one hand of holding that the presence of a copper compound such as verdigris in an alimentary substance was injurious to health in the highest degree, or on the other that the presence of a certain amount of copper in a food was of no consequence.

Med. R. Egger (Landshut) called attention to the fact that up to that time no one had said where the danger of copper in preserved vegetables begins.

The author replied that the copper compounds formed in the pre-

serves made with or without sugar are insoluble, and therefore not of importance.

Herr Kayser pointed out that in the consumption of preserves containing copper it was not water or a concentrated sugar solution that came into question, but the digestive juice, in which the author's experiments had not proved the copper compounds to be insoluble.

The author said that no copper passed from preserved vegetables into dilute acids.

Herr Hilger (Erlangen) recalled that all albuminoid substances form insoluble compounds with copper, and that said copper must be considered a normal constituent of the human body, a remark in which he was supported by Professor Medicus, of Wurzburg.

Director Kochler (Berlin) advised that in the fixing of a maximum limit of that kind regard should be had to the maximum dose in the Pharmacopœia. It was one thing for a poisonous substance to be present in an alimentary substance, and another for it to be introduced by a physician into a human body as a remedy against a disease already there. In the latter case the remedy was often itself injurious, but to a less extent than the disease upon which it acted, and it was always the care of the scientific physician to weigh these conditions.

Director Kochler said that during a visit to the Strassburg exhibition his attention had been attracted to the remarkably beautiful green color of some preserved beans, and upon inquiring as to how this color had been imparted he was told that it was a trade secret. Subsequently he had learned that during the boiling of these vegetables in a copper vessel an electric current was passed through the whole, the copper of the vessel acting as an anode. It was evident that in this way a large quantity of copper would be carried into solution.

At the close of the discussion, a resolution was passed to the effect that the meeting was not then in a position to come to a definite conclusion, but that it would await the results of further experiments with a view of forming a judgment at the next annual meeting.—Phar. Jour. and Tran., Aug. 8, p. 107.

Menthol wash for pruritus is made by Dr. J. J. Berry (*Med. Mirror*) by dissolving menthol ʒi in alcohol ℥i, and adding water 2 oz. and diluted acetic acid 5 oz. Apply with a sponge.

THE ANALYSIS OF BEESWAX.[1]

By C. Mangold.

On account of the natural fluctuations of the so-called constants of yellow beeswax, such as the acid and saponification numbers, as well as the iodine number determined by the Hübl process, adulteration with less than 6 per cent. of paraffin or ceresin is difficult to detect.

A. and P. Buisine, applying (*Bull. Soc. Chem.*, 1890, 3, 567) the principle previously enunciated by Hell, Stürcke and Schwalb, have devised a method of sufficient apparent value to warrant its investigation at the hands of the author.

The wax is saponified with potash and heated with potash lime, by which treatment the higher alcohols are converted into fatty acids with elimination of hydrogen, which serves as a measure of their amount. The hydrocarbons present are unattacked and can be extracted from the residue.

The author's investigations confirm those of A. and P. Buisine, and have led him to recommend the following method: 2–10 grammes of the wax are melted and saponified by potash-lime, the reaction being aided by stirring. The saponified product is powdered when cold, intimately mixed with three times its weight of potash-lime, and the mixture transferred to a thick-walled, pear-shaped bulb-tube, which is heated to 250° C. (for two hours, according to Buisine, *c.f.*, the time adopted by the author below) in a mercury bath contained in an iron vessel. This vessel is provided with a lid which screws on air-tight, pierced with four apertures through which pass air-tight, respectively, the pear-shaped bulb, a thermometer, a thermostat, and a long tube open at both ends to condense any mercury which may volatilize. A tube connects the pear-shaped bulb with a Hofmann's burette, in which the hydrogen is measured.

Although the author has made some determinations of its amount (obtaining results somewhat lower than those of Buisine), his attention has been chiefly directed to the estimation of the hydrocarbons present. Having observed, however, that the volume of hydrogen only becomes constant when the heating has been continued for three hours, he adopts this time as the

[1] *Chem. Zeit.*, 1891, **15**, 799; *The Analyst*, August, 1891.

minimum necessary for the determination of the hydrocarbons. After the completion of the reaction, the residue in the bulb-tube and the bulb-tube itself are powdered and extracted for some hours with petroleum ether in a Soxhlet's tube, the ether distilled off, and the residual hydrocarbon dried at 110° C. and weighed.

Schwalb has already noted (*Annalen*, 1886, 235, 149) that pure beeswax itself contains about 6 per cent. of hydrocarbons; while A. and P. Buisine have found as much as 12·5–14 per cent., a result confirmed by the author. In endorsing this statement, he arrived at the conclusion that as little as 2 per cent. of foreign hydrocarbons may be detected. The best approximation to the true proportion of paraffin is said to be obtained by assuming the quantity of hydrocarbons normally present in beeswax to be 13·5 per cent.

The following table gives some figures for unbleached beeswax of diverse origins:

Source of sample.	Hydrocarbons.	Acid number.	True saponification number (after deduction of acid number).
Aussee,	13·51	19·79	72·51
Native,	13·75	20·44	70·65
"	14·72	20·42	67·84
Dalmatia,	14·51	18·81	71·99
Hungary,	14·60	23·04	66·55
Bosnia (Banjaluka),	14·27	19·31	—
Slavonia,	13·76	20·95	70·23
Carniola,	13·64	20·08	69·62
Bosnia (Dolna-Tulza),	13·32	20·02	70·37
Lower Styria,	14·34	18·26	72·50
Lower Austria,	13·72	20·58	67·83
Mozambique,	13·37	19·42	71·78
Chili,	13·35	19·99	70·01
Monte Cristo,	13·50	20·24	67·45
Morocco,	11·02	21·66	77·02
Bombay,	14·04	—	—
Madagascar,	11·77	20·03	72·85
Saffi,	12·20	19·92	73·48
Oran,	11·55	19·91	79·99
Massanah,	12·80	21·11	69·49
Mogador,	11·40	20·85	75·55

A sample of yellow beeswax from Transylvania had an acid number of 16·66, and a total acid number of 72·68; that is to say, a true saponification number of 56·02, plainly indicating that it was adulterated with paraffin or some similar hydrocarbon. The total

percentage of hydrocarbons was 28·12, corresponding to an addition of 17 per cent. of paraffin calculated on the original wax. The percentage of hydrocarbons and the total acid number of the mixture being known, the total acid number of the original wax could be calculated, and was found in this case to be 87·6. A mixture made by adding 8 per cent. of paraffin to a genuine sample of beeswax gave figures on analysis corresponding to an addition of 7·4 per cent.

A few figures for bleached beeswax are also given:

Source of sample.	Hydrocarbons.	Acid number.	True saponification number (after deduction of acid number).
Smyrna, ...	10·93	20·87	68·33
Egypt, ...	11·35	20·04	69·94
Transylvania, ...	13·61	24·68	—
Hungary, ...	15·48	23·05	*79·49

* 74·49 in original.

According to A. and P. Buisine, bleached wax gives a lower result for hydrocarbons than yellow wax; the last two samples are apparently impure, and have been bleached by chemical means.

INFLUENCE OF MENTHOL ON THE GASTRIC FUNCTIONS.[1]

By Nikolai A. Vladimirsky.

Following Professor I. T. Tchüdnovsky's suggestion, Dr. Vladimïrsky has carried out a set of experiments on seven healthy subjects (six men, including himself, and one woman), aged from 24 to 32, the drug being administered with food, in the dose of 0·3, 1·0 and 2·0 grammes. The author has arrived at the following conclusions:

(1) The drug (in any of the doses stated) very markedly diminishes the proportion of free hydrochloric acid in the gastric juice, the decrease attaining its maximum in about 1 or 1½ hours after the ingestion.

[1] *St. Petersburg Inaugural Dissertation*, 1891, No. 77, pp. 44; Medical Chronicle, August, p. 367.

(2) In persons presenting a more or less weakened motor power of the stomach, the decrease lasts longer than in those with a normal one.

(3) The digestive power of the gastric juice is diminished.

(4) The transformation of proteids into peptones is retarded (hence an increased proportion of propeptones, *i. e.*, intermediary products of peptonisation).

(5) The proportion of lactic acid in the gastric juice is augmented, the rise proceeding parallelly with diminution in the proportion of free hydrochloric acid.

(6) The motor power of the stomach grows weaker (in about one hour after the ingestion); in initial stages of the digestion, however, it may occasionally undergo some increase.

(7) The absorptive power of the organ improves, which seems to be dependent upon a favorable (stimulating) influence of menthol on the circulation.

(8) Contrary to the statements of Ossendowski (*vide* the *Journal of Laryngology and Rhynology*, May, 1890, p. 202), L. Braddon, M. Reichert, S. Rosenberg, Hugo Koster, and many other observers, menthol does not appear to possess any special "appetite-making" power.

(9) In 1 and 2 gramme doses, the remedy gives rise to a kind of intoxication, followed, in 4 or 5 hours, by sensations of languor and drowsiness.

(10) Menthol may prove useful as a substitute for camphor.

OPIUM SMOKING BY THE CHINESE IN PHILADELPHIA.[1]

By Stewart Culin.

One of the effects of the McKinley bill has been an advance in the price of opium at most of the Chinese shops in Philadelphia and other cities where it is sold to opium smokers. The purchasers now receive only 11 *fan* (about 54 grains) of the best kind for 25 cents, instead of 12 *fan* (about 70 grains) as formerly. The Chinese are responsible for the introduction of this habit, one of the few customs or innovations they have introduced, and it now has a strong hold among a class of our people who are best defined by the word "fast," and who often take considerable pride in the

[1] From the *Public Ledger*, August 19, 1891.

practice of this form of dissipation. Many of them are learned in the art of smoking, the selection of pipes and all the details which are so carefully dwelt upon by the Chinese, and practically all of them are able to smoke the drug without assistance, as the enforcement of the law against the semi-public resorts have driven opium smokers to smoke in their own apartments.

The opium used for smoking is especially prepared for the purpose, the crude opium being macerated with water, which is evaporated, and the operation repeated until at the completion of the process a treacle-like mass is obtained. This is put up in white porcelain pots holding five *léung*, $6\frac{5}{9}\frac{8}{1}$ ounces avoirdupois, for use in China, and in brass cans containing the same amount for export. Most of the opium used for smoking in Philadelphia, and, indeed, throughout the United States, is imported from China in these cans. Such opium is distinguished from opium not manufactured or prepared in China, by the name of *kung in*, "superior opium," and is all said to be made by two firms in Hong Kong. These companies, syndicates of Chinese and English, have a monopoly of the manufacture, for which they pay an enormous sum annually to the British Government. Their product is sold to Chinese in this country through American agents in San Francisco. Two brands, known by the respective names of the companies, Lai Un and Fuk Lung, are sold here at, one at about $9 and the other at about $8.85 per can. The duty under the new law is $12, instead of $10, per pound, and the price has been advanced $1 per box by the change.

Opium is also prepared at Victoria, B. C. It is regarded as weaker and inferior to the opium manufactured in China, a difference which the Chinese explain as due to the water used in its preparation. More or less of it is imported here, where it is known to the Chinese as *Wik-to-li in* or "Victoria opium." It is sold here at about $6.80 per can, holding five *léung*. The lowest price of smoking opium in Victoria is $85 per 100 taels, equivalent to 20 cans, and as the duty is $5 per can, its lowest possible cost, duty paid, is $9.25 per can. It is fair to assume that the "Victoria" opium, as quoted in Philadelphia shops, is either a mixture made in California or has been smuggled. It is said that the highest price that can be obtained at wholesale for smuggled Victoria opium is $6 per can.

Smoking opium is not prepared from the crude drug to any

extent in the United States. A tax of $10 per pound is levied under our internal revenue laws upon opium for smoking manufactured in this country. No one who is not a citizen of the United States is permitted to engage in its manufacture, and bonds must be given in the usual manner.

OPIUM REFUSE MASS.—The scrapings from the opium pipes, which are always carefully preserved, are reboiled here by the Chinese, however, with an admixture of fresh opium, and sold under the name of *i in*, or number two opium.

This is also known as *in shi ko*, or "opium refuse mass," and is put up in regular cans, which are sold at from $2 to $5 per can. That made in California, which is called "California opium," commands the highest price. It is much weaker than No. 1 opium, and more of it has to be smoked to produce the same effect. According to Dr. H. H. Kane, it produces serious physical ills that do not obtain after the use of No. 1 opium.

THE PIPES.—The Chinese shops sell everything required by smokers. The bamboo pipe-stems cost from $1 to $1.25 and upwards, according to their thickness; the pewter socket to which the bowl and stem are united, 25 cents, and the bowls, about 50 cents apiece. Bowls that have been used and well saturated with opium are highly prized by their owners, and, with the bamboo stems that have been long in use, command very high prices. Old pipes are frequently seen offered for sale in the shops at $10 and upwards. The bowls usually display great beauty of workmanship. They are uniformly of graceful proportions, and are often decorated with incised Chinese characters. One of their most ingenious forms is that of a crab of iron gray material resembling slag, that has movable projecting eyes. Plain bowls are ordinarily used. Stands for pipe bowls, of which it is customary for smokers to have several, are made of dark colored wood, with panels of artificially colored marble inserted. They cost about 75 cents. Opium lamps of glass, said to be made in Birmingham, are imported from China and cost 75 cents to $1. Brass lamps for travellers cost $1.50. Small cylindrical boxes of buffalo horn, for carrying opium in the pocket, cost from 25 cents to $1, and are often beautifully decorated with inscriptions in gold and silver. Needles, on which the opium is cooked in the lamp flame, scissors for the lamp wick, and cleaners and scrapers for the pipe constitute, with the above, the usual outfit.

A very complete collection of these appliances may be seen in the Chinese collection in the Museum of Archæology of the University of Pennsylvania. It is customary in China for wealthy people to have much more expensive apparatus than is ordinarily used here.

Opium Boxes.—Opium is not sold directly from the can by the retail merchants, but always from a large pottery vessel. Many of the purchasers are provided with a small horn box. For the convenience of others the shop-keeper usually has a supply of the lichee nut, or of our ordinary playing cards, ingeniously cut and folded into a small shallow box, which he balances upon the pan of his hand balance. Opium is invariably weighed in this manner upon what are familiarly known as money scales, and the customer watches the operation, solicitous of obtaining good weight. It is always sold in sums of 25 cents' worth and its multiple. The profit upon it is considerable, amounting to $2.25 per can on No. 1 opium and much more when a mixture of several kinds is sold. The latter is customary. The shop-keepers say they have to suit the tastes of their customers, and that it is necessary to reduce the strength of the best opium. It is the custom for keepers of opium joints to purchase two boxes of No. 1 opium, two boxes of "Victoria" and two boxes of opium refuse. Mixtures of these various proportions are furnished by the shops, some of which sell as much as 14 *fan* (81 grains) for 25 cents.

The use of opium for smoking in Philadelphia gives employment to a man who mends pipes. His kit includes among several ordinary tools a bow drill like those used in China, of his own manufacture. The use of opium among the Chinese is also one of the reasons for the practice enjoyed by the Chinese physicians, and for the sale of expensive medicines in the Chinese shops. The Chinese claim that they experience little harm from opium, much less indeed than their American customers. Be this as it may, their stomachs and intestines as a rule are in a constant catarrhal state from the effects of smoking. Their tongues are always coated, and their usual condition is well illustrated by the way in which many of them commence their morning ablution. They pour a little water in a hand basin and lave their tongue with their hand. Then they apply a tongue-scraper, and afterwards they rub their tongue with a wet rag.

Smokers.—Smokers are divided by the Chinese into two classes, those who have "the habit" and those who have not. Those of the first class may occasionally be seen here in a condition in which they babble in their talk and appear prematurely old. The writer has not been able to trace the moral deterioration that invariably results from the excessive use of opium in other forms among the Chinese opium smokers, although it probably exists.

From an economic view the habit is a most extravagant one. Much time is taken up in preparing and consuming the drug, and days are sometimes lost in recovering from its effects. The occasional Chinese smoker will consume on an average 25 cents worth per day, while a victim of "the habit" will require from $1 to $1.50 worth during the same period.

In its behalf the Chinese urge the value of the drug as a prophylactic against the effects of cold andexposure, and contend that it is far less injurious than alcohol. They say, too, that while the habit is general few smoke to excess.

It is the opinion of at least some of our own physicians, who have treated patients for the habit, that the constitutional effects of smoking opium are much less serious than those arising from taking the drug in other ways, and, as compared with the use of morphia internally, are in the ratio of the effects of ether when inhaled and when taken into the stomach. However this may be, there can be no question as to the undesirability of the extension of the vice in this country. If the importations of prepared opium through the Custom House are an indication, it would appear that there is a considerable decline in the use of the drug. In 1880 the total importations, which had been gradually increasing, amounted to 77,196 pounds. For May 31, 1890, according to information kindly furnished by Mr. S. G. Brock, Chief of Bureau of Statistics of the Treasury Department, the importations were 29,955 pounds, and for the corresponding months of the present year, 66,549 pounds. The illegal importations, concerning the amounts of which it is impossible to obtain information, render conclusions based upon these returns very uncertain.

The writer has said that the Chinese are responsible for the introduction of the custom into the United States, but they are not the only ones that are blameworthy. As already stated, the preparation of this drug is a monopoly with the English in Hong Kong, as the

A very complete collection of these appliances may be seen in the Chinese collection in the Museum of Archæology of the University of Pennsylvania. It is customary in China for wealthy people to have much more expensive apparatus than is ordinarily used here.

OPIUM BOXES.—Opium is not sold directly from the can by the retail merchants, but always from a large pottery vessel. Many of the purchasers are provided with a small horn box. For the convenience of others the shop-keeper usually has a supply of the lichee nut, or of our ordinary playing cards, ingeniously cut and folded into a small shallow box, which he balances upon the pan of his hand balance. Opium is invariably weighed in this manner upon what are familiarly known as money scales, and the customer watches the operation, solicitous of obtaining good weight. It is always sold in sums of 25 cents' worth and its multiple. The profit upon it is considerable, amounting to $2.25 per can on No. 1 opium and much more when a mixture of several kinds is sold. The latter is customary. The shop-keepers say they have to suit the tastes of their customers, and that it is necessary to reduce the strength of the best opium. It is the custom for keepers of opium joints to purchase two boxes of No. 1 opium, two boxes of "Victoria" and two boxes of opium refuse. Mixtures of these various proportions are furnished by the shops, some of which sell as much as 14 *fan* (81 grains) for 25 cents.

The use of opium for smoking in Philadelphia gives employment to a man who mends pipes. His kit includes among several ordinary tools a bow drill like those used in China, of his own manufacture. The use of opium among the Chinese is also one of the reasons for the practice enjoyed by the Chinese physicians, and for the sale of expensive medicines in the Chinese shops. The Chinese claim that they experience little harm from opium, much less indeed than their American customers. Be this as it may, their stomachs and intestines as a rule are in a constant catarrhal state from the effects of smoking. Their tongues are always coated, and their usual condition is well illustrated by the way in which many of them commence their morning ablution. They pour a little water in a hand basin and lave their tongue with their hand. Then they apply a tongue-scraper, and afterwards they rub their tongue with a wet rag.

Smokers.—Smokers are divided by the Chinese into two classes, those who have "the habit" and those who have not. Those of the first class may occasionally be seen here in a condition in which they babble in their talk and appear prematurely old. The writer has not been able to trace the moral deterioration that invariably results from the excessive use of opium in other forms among the Chinese opium smokers, although it probably exists.

From an economic view the habit is a most extravagant one. Much time is taken up in preparing and consuming the drug, and days are sometimes lost in recovering from its effects. The occasional Chinese smoker will consume on an average 25 cents worth per day, while a victim of "the habit" will require from $1 to $1.50 worth during the same period.

In its behalf the Chinese urge the value of the drug as a prophylactic against the effects of cold andexposure, and contend that it is far less injurious than alcohol. They say, too, that while the habit is general few smoke to excess.

It is the opinion of at least some of our own physicians, who have treated patients for the habit, that the constitutional effects of smoking opium are much less serious than those arising from taking the drug in other ways, and, as compared with the use of morphia internally, are in the ratio of the effects of ether when inhaled and when taken into the stomach. However this may be, there can be no question as to the undesirability of the extension of the vice in this country. If the importations of prepared opium through the Custom House are an indication, it would appear that there is a considerable decline in the use of the drug. In 1880 the total importations, which had been gradually increasing, amounted to 77,196 pounds. For May 31, 1890, according to information kindly furnished by Mr. S. G. Brock, Chief of Bureau of Statistics of the Treasury Department, the importations were 29,955 pounds, and for the corresponding months of the present year, 66,549 pounds. The illegal importations, concerning the amounts of which it is impossisible to obtain information, render conclusions based upon these returns very uncertain.

The writer has said that the Chinese are responsible for the introduction of the custom into the United States, but they are not the only ones that are blameworthy. As already stated, the preparation of this drug is a monopoly with the English in Hong Kong, as the

production is with the same people in India. It all comes to us from British territory, after having paid double tribute to English purses. Forced upon the Chinese in China, the extension of its use to this country forms a natural, although, possibly, unforeseen part of the mercantile propaganda of the ruling power in the East.

AMMONIUM SELENITE AS A REAGENT FOR THE DETECTION OF THE ALKALOIDS.

Lafon called attention to (see Amer. Jour. Phar., 1886, p. 250) ammonium sulphoselenite as a reagent for morphine and codeine. He prepared it by dissolving 1 gm. ammonium selenite in 20 cc. concentrated sulphuric acid. The author has studied the reagent further in its reactions with other alkaloids, placing small portions of the alkaloids in his experiments upon watch glasses set upon white paper. The following is the table he has prepared:

Atropine. No coloration.

Aconitine. No immediate coloration; after 20 minutes, a very slight rose-color.

Berberine. Greenish yellow, becoming successively very brown rose at the margins and violet in the middle; half an hour afterwards entirely vinous red, which lasts for three hours.

Brucine. Reddish or rose color, becoming pale orange; half an hour after, an amber color, and no deposit.

Caffeine. No distinct coloration. At end of three hours, the liquid was reddish, and there appeared a slight deposit.

Cinchonine. Nothing.

Cinchonidine. Nothing.

Cocaine. After half an hour, no decided coloration or precipitate. After three hours the same reaction as caffeine.

Curarine. Slight violet coloration: after some time reddish. No red deposit at the end of three hours.

Delphine. Slightly reddish coloration, passing into a violet red. No ppt. at the end of three hours.

Digitalin. No immediate color. Yellowish after half an hour. After three hours a reddish deposit.

Eserine. Lemon yellow color, turning to orange. Three hours afterwards the color was paler.

Morphine. Bright greenish blue; half an hour after maroon yellow and no deposit. After three hours, the liquid maroon brown, no red deposit.

Narcotine. Bluish color, becoming violet and then reddish. After half an hour a fine reddish color and no ppt. After three hours a small red deposit.

Narceine. Yellow-green color, becoming brownish, and after half an hour reddish. Afterwards a red deposit, which is very distinct in two or three hours.

Papaverine. Bluish color; the liquid becoming bottle-green, dirty yellowish green, violet blue, then red. A small bluish deposit.

Pilocarpine. Nothing.

Solanine. Canary yellow, and then brownish. After half an hour, a rose colored ring, and after three hours the liquid becomes violet red.

Saponin. Yellowish, becoming slightly reddish. (Reaction not distinct.)

Senegin. Light, dirty yellow. After three hours, liquid reddish.

Veratrine. Indistinct yellowish color, sometimes with a green tone. After half an hour yellow. After three hours, deposit red and liquid yellowish. (Reaction indistinct.)

—A. J. Ferreira de Silva, Comptes Rendus, 112, 1266; Jour. Anal. and Applied Chem., Aug. 1891, p. 478.

THE CAUSE OF THE SLIGHT SOLUBILITY OF CHEMICALLY PURE ZINC IN ACIDS.[1]

By J. M. Weeren.

The slight solubility of pure zinc in dilute acids is usually explained by supposing that the solution of impure zinc is in reality due to the electric currents set up by the contact of the zinc with the impurities, and that as in pure zinc no such currents can occur, it remains undissolved. This theory does not, however, account for the solubility of the pure metal in nitric acid, or even in dilute sulphuric or hydrochloric acid at their boiling points, and the author has, therefore, again investigated the subject. As the result of his experiments he finds that the insolubility of the pure zinc is due simply to the formation of a condensed layer of hydrogen on the surface, which then prevents the further action of the acid. In the case of nitric acid, this layer is oxidized by the acid as it forms, and cannot protect the surface of the metal, whilst in the case of impure zinc, the hydrogen is evolved from the surface of the more electronegative impurities according to the usual law, thus leaving the surface of the zinc exposed to the action of the acid.

The experiments were made with chemically pure zinc and sulphuric acid, the latter being diluted with 20 parts of pure water. It was proved that even such simple means as brushing the surface of the zinc caused a considerable increase in the quantity dissolved. This became much more striking when the reaction was allowed to take place in a vacuum, the relation of the mean quantity dissolved

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[1] *Berichte*, **24**, 1785–1798; *Jour. Chem. Soc.*, Sept., p. 983.

under atmospheric pressure and in a vacuum being 1 : 6·6. The quantity of impure zinc dissolved under similar conditions was found to undergo very little change.

In the next series of experiments, the quantity of pure zinc dissolved by the acid at different temperatures was determined. The quantity dissolved in 30 minutes increased regularly from 2·1 milligrams at 0° to 9·3 milligrams at 98°, but as soon as 100° was reached and ebullition commenced the quantity rose to 122·1 milligrams. This is in full agreement with the author's theory, as the evolution of bubbles, which start for the most part from the zinc plate, would naturally affect the hydrogen film and expose fresh surfaces of the zinc to the action of the acid. If the temperature be raised above 100° by increasing the pressure, the quantity of zinc dissolved is not appreciably more than at 98° so long as ebullition does not take place. The quantity of impure zinc dissolved is not appreciably affected by the ebullition of the liquid.

The addition of chromic acid and of hydrogen peroxide to the acid also causes a great increase in the solubility of the pure zinc, the former causing an increase in the ratio 175 : 1, and the latter in the ratio 306 : 1, a result which is again strongly in favor of the author's theory. These oxidizing agents do indeed also increase the solubility of impure zinc, but to a much smaller extent, the ratio for chromic acid being 6·5 : 1, for hydrogen peroxide 3·5 : 1.

Similar results have been obtained with cadmium, cobalt, iron and aluminium. The latter, which is as a rule almost insoluble in dilute acids, dissolves readily in a vacuum, and also dissolves under similar conditions in neutral ferric chloride solution, the latter being reduced to ferrous chloride by the hydrogen evolved.

TWO NEW ALLOTROPIC STATES OF SULPHUR.

Two new allotropic conditions of sulphur have been prepared by Engel in the following way: two volumes of a solution of hydrochloric acid containing from 25 to 30 per cent. of acid, and at a temperature of 10°, are mixed with constant stirring with one volume of the same strength of a solution of hyposulphite of soda. Chloride of sodium is precipitated and hyposulphurous acid set free. The acid in this condition possesses a sufficient stability to permit of its being filtered without coloration. Little by little the filtered liquid becomes yellow and the intensity of the coloration increases, and at

the same time sulphurous acid is disengaged. When the yellow tint has become very pronounced and before the liquid has become cloudy from the precipitation of sulphur, the filtered solution is shaken with an equal volume of chloroform. The chloroform is separated in a separatory funnel and left for spontaneous crystallization. There are thus rapidly obtained some crystals of sulphur, which are absolutely different from octahedral sulphur. The sp. gr. of these crystals is 2·135. Their crystallographic nature has been studied by Friedel.[1]

These crystals belong to the rhombohedric type as manifested by the deportment with polarized light and crystalline measurements and are absolutely different from any other form of sulphur known.

At the moment of their preparation they are transparent and remain so for 3 or 4 hours. Then they commence to increase in volume and pass little by little into a state of insoluble amorphous sulphur. They melt below 100°. The coloration of these crystals is orange yellow and not lemon yellow as are those of octahedral sulphur and their analysis shows that they are composed entirely of sulphur.

A solution of hyposulphurous acid in HCl, prepared as directed above, when left gives a precipitate of sulphur which, on cooling, unites into yellow flakes. In this state, the sulphur is entirely soluble in water. Not only does it dissolve when water is added to the liquid which holds it in suspension, but when spread rapidly upon a filter, it preserves in *toto* its solubility in water. The solution in water is rapidly decomposed, giving the ordinary amorphous sulphur.

The explanation of the formation of these two allotropic forms of sulphur appears to be the following: hyposulphurous acid in the conditions before mentioned undergoes a progressive decomposition into sulphurous acid and sulphur. This sulphur is now in the atomic state or at least in the state but little removed therefrom. Little by little the sulphur, after separation, is condensed to the molecular form. This condensation takes place in two different manners according as the sulphur has been dissolved or not, from the liquor in which it is generated, by chloroform. In the first case the sulphur passes at

[1] *Comptes Rendus*, Vol. 112, No. 16, p. 834.

once into the crystalline form. In the second case it is transformed into amorphous sulphur soluble in water before it attains its maximum condensation.—*Comptes Rendus, Vol. 112, No. 16, p. 860. Jour. Anal. and Applied Chem., Aug., 1891, p. 475.*

TWENTY-EIGHTH ANNUAL MEETING OF THE BRITISH PHARMACEUTICAL CONFERENCE.

The proceedings commenced in Cardiff, Wales, on Monday evening, August 17, with a reception by the President, Mr. WILLIAM MARTINDALE, and other officers of the Conference, held in the Assembly Rooms in the Town Hall, and was followed by a Conversazione, varied by an exhibition of objects of scientific interest and an excellent chamber concert.

On Tuesday morning, at ten o'clock, the members of the Conference met in the Lecture Theatre of the University College of South Wales and Monmouthshire, when the Marquess of BUTE, as Mayor of Cardiff and President of the College, gave them a hearty welcome. After a suitable acknowledgment by the PRESIDENT, the Senior Honorary General Secretary read a list of Delegates accredited from various associations, and several letters of apology from absent members of the Conference.

The regular business commenced with the reading of the Financial Statement by the Treasurer, Mr. R. H. DAVIES. It contained the usual items, and resembled some of its more recent predecessors in showing that the expenditure had again exceeded the receipts by a few pounds. The principal sources of income had been the members' subscriptions, amounting to £476 12*s.* 3*d.* (representing 1,271 annual payments), or about £50 less than in the previous year, and £135 7*s.* 6*d.* on account of "Year Book" advertisements and sales. On the other side the principal outlay had been in connection with the production of the "Year Book," amounting to £515 0*s.* 4*d.*

The Report of the Executive Committee, which was then read by the Senior Honorary General Secretary, was not very startling or even cheerful in its character. It commenced with a statement as to the work of the Unofficial Formulary Committee which was also subsequently made the subject of a special report, and then briefly referred to the resignation of the late Assistant Secretary and the appointment of a successor, the presentation of an Address to the Pharmaceutical Society on the occasion of its Jubilee celebration, and the revision of the "blue list." Mention was then made in suitable terms of the irreparable loss sustained by the Conference in the death of its former President, Mr. H. B. BRADY. The only other important paragraph was one containing an expression of regret that the special efforts made since the last meeting to increase the membership of the Conference have failed to realize the anticipated success. On the motion of Mr. MUNDAY, seconded by Emeritus Professor REDWOOD, the report was unanimously adopted.

The PRESIDENT then rose to deliver his address. Commencing with a brief reference to the fact that the present was the second visit of the Conference to Wales, and some complimentary remarks as to his predecessors in the chair, the speaker proceeded to discuss first the relations of the pharmacist to the

public. Tracing an analogy in the recognized position of the press in politics as the fourth estate of the realm to that of pharmacy as the fourth estate of medicine, he expressed a fear that this latter position was not always accorded, and that there was now almost a risk of the pharmacist having to give precedence to the nurse. This was partly accounted for by the fact that the pharmacist does not come into such close contact with the patient during the time of suffering, his meed of gratitude being often the thankless one of having supplied nasty physic. In his relations, however, with the medical profession the pharmacist met with more appreciation, as evidenced by the "acknowledged position" accorded to him by the Medical Council in the compilation of the recently published Additions to the Pharmacopœia. The speaker then proceeded to refer to some of the advances that have been made in recent years in the treatment of disease by medicines, and referred to some of the services that had been and might be performed by the pharmacist. The tendency of pharmacy of late, it was pointed out, had been to prepare medicines in as definite and stable a form as possible, and to provide chemical substances of which the purity could be tested. Modern chemistry had in many cases isolated from valued drugs definite active principles, which, having to some extent the same properties as the crude drugs, had been so far accepted medically as possessing the same therapeutic action; but still in this direction much was left undone. In many investigations the therapeutist and the pharmacist came between the physiologist on the one hand and the chemist and botanist on the other. The advances in chemical science and the experimental investigation of recent physiologists and therapeutists had tended to prove that the physiological action on the system of the simpler chemical compounds is, in many cases, a chemical and physical action of the elements of which they are composed, "modified to some extent by what is called life." In the more complex organic substances also there was a marked connection between physiological action and chemical constitution. The physiological action of a certain compound having been ascertained, chemists had endeavored by introducing several certain elements or groups of elements of known properties to modify the action of the original compound in the direction desired by the physiologist or therapeutist. Generally the chemist had been in advance of the physiologist, but the physiologist had at times, by a process of induction, indicated the direction in which he desired the chemist to work. But progress was still hampered by the want of clearer knowledge as to the constitution of many of these complex bodies and their derivatives. These points were illustrated by references to the researches on the relative constitution of morphine and codeine, and of caffeine, theobromine and xanthine; the work of STAHLSCHMIDT, BROWN and FRASER, and TAFEL on the methyl and ethyl derivatives of strychnine; and the gradual building up of kairine, kairoline, thallin, antipyrin and other compounds. But it was pointed out that the prognostications as to the effect of the new compounds on disease are not always fulfilled, as in the case of tetronal. The PRESIDENT then passed on to other forms of the treatment of disease which have recently attracted attention, speaking especially of the medical use of various lymphs, the preparation of which might one day, he thought, form part of the occupation of the pharmacist. But all these novelties notwithstanding it was thought probable that physicians would long continue to order the pure active principles, or extracts or solutions of natural drugs, and in the preparation of these the pharmacist

would be in his element. From this point of view, the work that had been done in respect to standardization was important, and the communications of Messrs. FARR and WRIGHT showed the necessity for further uniformity. Still this might be overdone, for how could the medicinal action of rhubarb, cascara, or senna, or the appetizing effect of compound infusion of gentian be standardized? Reference was then made to the present imperfect provision for teaching pharmacy to the medical student, and the opinion was expressed that a course of six months' practice under the eye of a pharmacist would be of great service to the embryo medical practitioner before commencing his hospital career. It was pointed out that if the coming race of medical practitioners receive no practical training in pharmacy, they will have no confidence in prescribing, because they will never have known their medicines, and that they will consequently become a prey to the advertising manufacturers of ready-made mixtures and specialties, instead of making use of official preparations. It was recognized, however, that the making of preparations in a wholesale manner might in some cases be for the public weal, though to the detriment of the pharmacist's interests. Some remarks upon the position of the chemist and druggist in respect to the sale of nostrums, and the onus that lies upon him to supply the identical article asked for if he supplies any, led up to a discussion of the question of the introduction of synonyms into the Pharmacopœia. Upon this the opinion was expressed that, notwithstanding Dr. ATTFIELD'S reasoning in his recent report, if the British Pharmacopœia is to be made the commercial as well as the medical standard for the articles it contains, and the proposed synonyms are tacked on to the official preparations, pharmacists will often be placed in greater doubt and difficulty, or even danger, than they are at present. If the official list of synonyms were to be extended it would require to be carefully watched, else pharmacists would be placed at great disadvantage as compared with the drysalter in supplying many substances used in the arts and manufactures in a more or less crude condition. After allusions to the work done in the Research Laboratory and the celebration of the Jubilee of the Pharmaceutical Society, a word or two was said as to the desirability of extending the scope of the preliminary examination, and the address concluded with a record of the loss the Conference had suffered since the previous meeting by the death of its former Treasurer and President, HENRY BOWMAN BRADY. At the conclusion of the Address a vote of thanks to the PRESIDENT, moved by Mr. G. F. SCHACHT and seconded by Emeritus Professor REDWOOD in an interesting autobiographical speech, was carried by acclamation.

Before proceeding to the reading of the papers the President, as Chairman of the Unofficial Formulary Committee, presented a report. This was very short, being practically limited to a statement that a new edition of the Formulary had been issued, in which the nine formulæ authorized in 1889 had been incorporated, together with six others; while seven formulæ had been deleted on account of their having been now accorded a place in the official additions to the British Pharmacopœia.

The reading of papers was then commenced. The first was a report upon *Ipecacuanha*, by Messrs. CRIPPS and WHITBY, which was the communication referred to in the report of the Executive Committee as the first instalment of an investigation in aid of which a grant was made from the Conference funds some time ago. The investigation had its origin in the need felt to exist for a

thorough chemical examination of ipecacuanha root, on account of the conflicting statements that have been made as to the quantity of emetine it contains and the comparative ignorance as to the other constituents of the drug. The paper contained the details of a general proximate analysis, for which purpose ipecacuanha root in No. 80 powder was exhausted successively with petroleum ether, absolute ether, 65 per cent. alcohol, cold distilled water, and 0·2 per cent. solution of sodic hydrate. From the general results it appeared that the total alkaloid obtained amounted to 2·42 per cent., which probably was not all emetine, though no confirmation was afforded to the alleged presence of a volatile base in the root. Saccharose was found to the extent of 2·12 per cent., dextrose 4·06 per cent., dextrin 2·08 per cent., and starch 44·44 per cent. Among the other constituents observed were a trace of volatile oil, tannin, free fatty acid, neutral fat, various resins, and a glucoside which gave a frothy solution in water, but was not saponin.

This was followed by a short note in which Mr. W. H. SYMONS described the preparation of an *ammoniated tincture of ipecacuanha*, which had remained clear although made five years ago. The formula was to moisten one ounce of ipecacuanha with one dram of 10 per cent. solution of ammonia and then slowly percolate to twenty ounces with 10 per cent. spirit.

Extractum Euonymi siccum was the subject of the next note by Mr. M. CONROY. In it the author criticised the statement made in the Additions to the B. P. that when this extract is prepared according to the official formula "the mass may be powdered and kept in a well-corked bottle." Mr. CONROY says that the preparation, when made on a large scale, is really so hygroscopic that the operation of powdering has to be performed in a warm dry room, whilst even then it is very difficult to obtain a satisfactory result, and the resulting powder soon coheres and forms a mass. By drying the extract without the sugar of milk and adding the sugar during the powdering, more satisfactory results were obtained. But another plan, which the author says proved in every way a success, was to add light calcined magnesia instead of sugar of milk to the soft extract. The operation of powdering was then performed under ordinary atmospheric conditions without any precaution, and the pulverized extract remained a perfectly mobile powder. The paper led to considerable discussion, some objection being raised to the introduction of so much of an insoluble substance like carbonate of magnesia, while Mr. NAYLOR said the hygroscopicity of the preparation is due to extractive which is not present in the preparation upon which euonymin gained its reputation.

The next paper read was a practical communication upon *Indian Gums for Pharmacy Work*, by Dr. RIDEAL and Mr. W. E. YOULE. The gums from India which find their way into the English market were divided for the purposes of this paper into two classes, those which are entirely soluble in water and exude from species of acacia, of which "amrad" is the most important, and those not entirely soluble in water and not derived from species of acacia, which are known under the generic name "ghatti gum." It is the latter class of gums that form the principal subject of the paper, the "amrad" gums being simply referred to as not of much importance from a pharmaceutical point of view, and as resembling in physical properties second-rate gum arabics. The authors, whilst differing from other observers as to the amount of ash yielded by ghatti gum, which they find to be about 26 per cent., or somewhat less than

the ash from genuine gum arabic, confirm previous statements that the mucilage formed from it is decidedly more viscid than that from ordinary gum arabic. The "absolute viscosity," as determined by a specially constructed apparatus, ranged from 10 per cent. solutions of gum arabic from ·0639 to ·1850; whilst 10 per cent. mucilages of "ghatti" ranged from ·2880 to ·3621 and 5 per cent. from ·1350 to ·1760. The authors are of opinion therefore that to produce from average ghatti gum a mucilage corresponding in viscosity to the B.P. mucilage of acacia it would be necessary to use not less than 8 parts of water to 1 part of gum. The reagents best suited for the detection of ghatti gum were stated to be ammonium oxalate, which produces in the mucilage only a slight turbidity as compared with the copious white precipitate thrown down from gum arabic; ferric chloride, which causes a slight darkening and a gelatinous precipitate; alcohol, which throws down only a slight precipitate; and mercuric chloride, which produces a white, stringy precipitate, whilst with gum arabic it gives no perceptible reaction. Ghatti mucilage is described by the authors as yellowish or light brown in color when properly made, and as being much more permanent and retaining its viscosity unimpaired for a longer time than mucilages of inferior gum arabics from Senegal and Barbary. As is known, commercial samples of ghatti gum are generally dirty and mixed with fragments of bark, the tannin from which, if it goes into solution, spoils the color of the mucilage and causes a further darkening in contact with iron salts. In order to avoid this objection it is recommended that the gum be powdered in porcelain or stone ware, the powder treated with half the quantity of cold water required for the finished mucilage, the whole well stirred until the swollen metarabin has separated from the soluble gum, then strained through muslin, and the swollen pieces of insoluble gum picked out and submitted to similar treatment with the remainder of the water. In this way a strong mucilage can be obtained before the cold water has had time to dissolve out the tannin from the *débris* to any appreciable extent. In the authors' opinion mucilage made in accordance with these directions is quite capable of replacing gum acacia for pharmaceutical work. In the discussion of the paper, however, this position was disputed by several speakers; at the same time it was admitted that for many technical purposes gum ghatti forms a useful substitute for gum acacia.

The Conference then adjourned for luncheon, and on resuming a paper was read on the *Estimation of Volatile Oil in Copaiba*, in which Mr. CRIPPS described an apparatus he had devised for the purpose. In this the copaiba is submitted to the action of a current of steam, which rapidly removes the volatile oil and leaves the resin in an unaltered condition. Incidentally it was mentioned that in eleven commercial samples of copaiba quantities of volatile oil varying from 40·95 to 59·6 per cent. had been found, and that turpentine appears to be now seldom employed to adulterate copaiba.

The occurrence in commerce in recent years of a *Liquid Persian Galbanum*, in the form of a reddish-brown liquid of the consistence of Venice turpentine, has led Mr. E. M. HOLMES to attempt to clear up the local and botanical origin of the different varieties of galbanum, and his conclusions were given in the paper next read. Galbanum is usually spoken of either as "Levant" or "Persian," the sorts termed "Persian" differing from the "Levant" in the possession of a turpentiny odor in addition to that of galbanum. Mr. HOLMES is of

the opinion that all the varieties of galbanum of commerce under either name come through Persia. As to the botanical origin, so far as evidence is at present obtainable, it appears probable that "Levant" galbanum is yielded by *Ferula galbaniflua* and its variety *β-Aucheri*, and the solid "Persian" galbanum possibly by *Ferula Schair*, Borszcz, but the liquid Persian galbanum by a species nearly allied to *F. galbaniflua*, judging from the fruits found in it. It would appear also that the "*Ferula galbaniflua*" found by Dr. AITCHINSON in Afghanistan is not identical with the *Ferula galbaniflua* of BOISSIER, and that neither it nor *Ferula rubicaulis* yield galbanum.

A Short Description of the Present and Future Water Supply of Cardiff was then read by Mr. THOMAS HUGHES, the borough analyst. The present sources of water supply to Cardiff are the Ely pumping station and the gathering grounds of Lisvane and Llanishen. The water from the Ely pumping station is obtained from headings or culverts driven into the magnesian limestone, and has a total hardness of from 28 to 30 parts. The water from the gathering grounds of Lisvane and Llanishen is also somewhat hard and not too free from organic pollution, which is likely to increase. The two sources yield about twenty gallons per head of the population of the district served, and in order to augment this quantity and provide for increasing numbers the Cardiff Corporation has commenced the necessary works for obtaining a large and pure supply from the Upper Taff Valley. The quality of the water from this gathering ground, which consists of mountain pasture land, is said to be excellent, being very soft and "favorably free from organic contamination," while the bleak and uncultivated character of the district, and its distance from any centres of population, are considered sufficient to guarantee safety from future pollution.

Next, Mr. A. W. GERRARD followed up his paper of last year on the *Alkaloidal Values of Henbane* grown in this country, by a report on the results of analyses of commercial samples from Germany and France. The German sample, which is described as having had "a rough look, somewhat musty and narcotic odor and dull green color," was composed largely of the entire annual plant, with about one-fourth of its weight of first year's biennial leaves, in some cases with the roots attached. The French variety had a fair appearance, was pale green, and had a mildly narcotic odor, and consisted entirely of the first year's biennial plant, mainly leaves, with here and there a root attached. Both samples appeared to have been collected at least two years, and they were therefore compared with English specimens of corresponding age. The yields of alkaloid were, from the German, 0·0295 per cent.; from the French, 0·0398 per cent.; from the English first year's biennial leaves, 0.0390 per cent., and from second year's biennial tops, 0.0451 per cent. As the average yield from the fresh English leaves, as reported last year, was 0·0665 per cent., it would appear evident that changes detrimental to the quality of the drug must take place with the ageing of a sample.

The last paper read on Tuesday was on the *Constituents of Henbane Seed*, by Mr. F. RANSOM, in which the author contributed more definite information as to the amount of alkaloid these seeds contain, previous statements as to which vary from 0·05 to 0·16 per cent. Working by a process that he describes, on seeds from biennial plants of *Hyoscyamus niger* grown at Hitchin, he obtained a quantity of crystalline alkaloid corresponding to 0·058 per cent. in

the dried seed. This is rather less than the quantity of alkaloid obtained by Mr. GERRARD from biennial leaves, as reported by him to the Conference last year, and fails to sustain current impressions as to the relative richness of the seeds in alkaloid. For this reason, and on account of the large quantity of the fixed oil the seeds contain (18·8 per cent.), Mr. RANSOM does not think they can be advantageously used for galenical preparations.

At the conclusion of this sitting most of the members and a good number of ladies made their way to the Pier Head, where they embarked for a channel trip past Penarth Head to Barry Island. The weather was not propitious, rain falling heavily during the entire passage, but it cleared up on landing, and after a somewhat long and unpleasant walk, made longer than it need have been by some uncertainty as to the right destination, the company arrived at the Barry Dock Hotel, where tea had been provided. By the time this had been disposed of the boat had been brought into the dock, closer to the hotel, and the company having again embarked, the return passage was made to Cardiff, which was reached about nine o'clock.

On Wednesday morning the Conference reassembled soon after ten o'clock. In the first paper read, on *Glacial Phosphoric Acid*, Mr. JOHN HODGKIN recorded the results of the analysis of a series of English and foreign samples, which he was induced to undertake by the discovery that a sample of glacial phosphoric acid, represented as being of the quality usually imported into the American market, contained a large proportion of sodium. A sample prepared especially from syrupy phosphoric acid and ammonia, which was obtained in bright colorless lumps, deliquescent to a certain extent, showed upon analysis that it is impossible to drive off all the ammonia by heat, the amount left being equal to 8·05 per cent. of ammonium; it also contained a little silica. The total acid, taken as HPO_3, amounted to 91·52 per cent., of which 48 per cent. was free. A sample of English make, in bright, colorless, somewhat deliquescent lumps, contained both ammonia and soda, as well as arsenic, the total acid as HPO_3 amounting to 92·8 per cent., of which 52·8 was free. Four other samples, one in sticks, contained diminishing amounts of free acid, showing respectively 85·44 per cent. of HPO_3, with 46·08 free; 84·48 per cent., with 31·68 per cent. free; 83·84 per cent., with 36·48 free, and 80·10 per cent., with 42·21 per cent. free, the base in each case being practically sodium. A sample made by adding sodium phosphate to ammonium phosphate liquor and calcining retained nearly 5 per cent. of ammonium, whilst one made by calcining microcosmic salt proved to be pure sodium metaphosphate. Speaking of the four samples referred to above together, Mr. HODGKIN expressed the opinion that there is absolutely no reason for such large additions of sodium phosphate, except that it enables the manufacturer, in the absence of any official standard of purity, to undersell the honestly made article.

Mr. M. CONROY then read a note on a *Proposed Method of Standardizing the Extracts of Nux Vomica and Opium*, in which he attempted to deal with the inconveniences resulting from the consistence of these extracts when standardized according to the official formulæ. The modification proposed is to exhaust the drug as at present, then to evaporate to a pilular consistence, test the alkaloidal strength and make up to the correct standard by the addition of glucose. It was also pointed out that genuine Asia Minor opium, dried and powdered as directed, yields 13 to 15 per cent. of morphine by the official

test, and that as such opium yields about 50 per cent. of extractive, an extract of opium of 20 per cent. morphine strength is always too soft if fine opium has been used in its preparation. Mr. CONROY is of opinion the standard of the dry powdered drug should be at least 12½ per cent., the official preparation being correspondingly increased in strength. In the discussion that followed Mr. J. C. UMNEY said a nux vomica extract that was too thin could be stiffened by adding to it extractive obtained by treating the marc from the first operation with a more dilute spirit. Mr. J. BARCLAY said extract of opium could be similarly stiffened with an extractive obtained by treating opium with hot water, but it was pointed out that such an extractive might contain narcotine and other objectionable substances. The PRESIDENT was inclined to favor the use of sugar of milk rather than glucose if an extraneous agent were employed at all.

In the succeeding paper Mr. A. H. ALLEN offered a contribution to the solution of the difficult question of the *assay of aconite preparations.* Apparently the best method would depend upon the determination of the quantity of crystallizable alkaloid, but a difficulty arises in the uncertainty as to the extraction of all the crystallizable alkaloid in that condition. The method that commends itself to Mr. ALLEN depends upon the ready saponification of the aconite alkaloids. After extracting the alkaloid by FARR and WRIGHT'S process and converting it into hydrochloride it is saponified by boiling with sodium hydrate, the products being, in the case of aconitine, benzoic acid and aconine. The benzoic acid, dissolved out with ether, is titrated with $\frac{1}{50}$ normal baryta water in the presence of phenolphthalein, and the results are then calculated out on the assumption that each equivalent of benzoic acid represents an equivalent of crystalline aconitine. The correctness of this assumption was, however, afterwards questioned by Mr. J. C. UMNEY, who said that he could confirm the statements of WRIGHT and JURGENS, that *Aconitum Napellus* contains, besides crystalline aconitine, a gummy base that yields on saponification a proportion of benzoic acid, which would by this method be reckoned in terms of aconitine, although he had taken a grain of it without inconvenience.

The next paper, by Messrs. R. H. DAVIES and PEARMAN, apparently had its origin in an attempt to answer a question on the "blue list," as to whether the time has not arrived when it is possible to give a better definition of *Oleum eucalypti*, B. P. The authors recorded the results of a large number of experiments upon the chemical and physical properties of a series of essential oils from different species of *Eucalyptus.* A definite answer to the question has not, however, been arrived at; but if it be granted that eucalyptol is the most important constituent of eucalyptus oil, some indications as to the relative value of an oil may be given by its effect on polarized light, pure eucalyptol being practically inactive. An oil with a rotatory action equal to that exerted by ordinary "amygdalina" would therefore be relatively of low value. The "globulus" oil is known to contain a fair amount of eucalyptol, and to it may be added, according to the authors, the "oleosa" and "dumosa" oils.

The Conference then adjourned for luncheon, and on resuming Mr. JOHN MOSS read a communication upon *Cascara Bark and its Extracts*, which possibly may lead to a modification of the official formula for one of the preparations of this drug. The author has found that although boiling water does extract all the active constituent of the bark, the whole of these are not

retained when the decoction is concentrated, and the deposit is not redissolved upon the addition of rectified spirit as ordered in the official formula. He concludes, therefore, that an aqueous liquid extract does not represent the full activity of the bark. On the other hand, he states that proof spirit exhausts the bark completely, and throws down no deposit of therapeutic value, a proof spirit liquid extract being more powerful as a laxative and an aperient than one made by the official method. Further, from some observations made upon the therapeutic action of liquid and solid extracts of samples of cascara sagrada collected in the spring of 1888, 1889 and 1890, and in the summer of 1890, it appeared that bark collected in late summer is in no way inferior to that gathered in the spring, and that the older the bark the more benign is its action. The bark from South Oregon seems also to be preferable to that collected in North Oregon.

Mr. S. M. BURROUGHS then read a short note on a preparation of *castor oil and malt extract*, flavored with essential oil, in which the flavor of castor oil is hardly perceptible. It is made by rubbing up malt extract in a warm mortar until moderately liquefied and then triturating with it an equal volume of castor oil and flavoring according to taste. Mr. BURROUGHS was undecided as to whether the preparation is a solution or an emulsion, but on the addition of water it forms a milky emulsion.

The next paper read, on the *Opium used in Medicine*, by Mr. E. M. HOLMES, contained a suggestion that appears to be worthy the consideration of the Indian Government. It is well known that, apart from the efforts that are being made to persuade the Indian Government to discontinue the cultivation of opium for introduction into China, there is a probability that the Indian industry will soon be largely affected by the increased production of opium in China for home consumption. Mr. HOLMES points out that the opium used in Great Britain and her colonies for medicinal purposes is now almost exclusively obtained from Turkey. He thinks that an opium containing the requisite proportion of morphine could be produced in the hilly districts of India, and in view of the probable partial collapse of the trade in the drug with China, he suggests that attention should be paid in India to the production of a medicinal opium that should compete in appearance and strength with Turkey opium in the British and colonial markets.

In a report upon *Medicated Lozenges*, B. P., Mr. DAVIS gave the results of analyses of samples of the thirteen official lozenges obtained from six "leading manufacturers." In respect to weight it was found that the lozenges of the various makers differed from one another very materially, and, not only so, but that lozenges from the same makers, and even in the same parcels, varied to the extent of two grains. As to the quantity of active ingredient, when the average quantity in half a pound of lozenges was taken the result was satisfactory in some few cases and very unsatisfactory in others; but when individual lozenges were taken deficiency or excess of active ingredient became apparent. Tables were appended to the paper showing the weights of the lozenges and the quantities of the active ingredient found. Referring to the gum employed in making the lozenge, the author stated that three out of the six sets of samples contained no gum acacia, but either tragacanth, or tragacanth and dextrin. In two others a mixture of acacia and tragacanth had been employed, whilst in the sixth some of the acacia had been replaced by dextrin. Mr. DAVIS is not satis-

fied with this state of affairs, and he suggests that either the pharmacist should prepare his own lozenges so that each should have a definite weight; or that the Pharmacopœia should state the exact weight of each lozenge, instead of ordering a certain mass to be divided into a certain number of parts; or that the lozenges should be omitted from the Pharmacopœia altogether.

A short note by Mr. SHEPHEARD called attention to a possible danger that may attend the dispensing of prescriptions ordering *liquor strychninæ* together with an alkaline liquid. In the case mentioned Liq. Fowleri ʒiss was ordered with an equal quantity of Liquor Strychninæ, to be made up to ℥iv with distilled water. Fine acicular crystals were thrown down, which dissolved upon the addition of a few drops of hydrochloric acid and remained in solution. It was suggested that in such a case the prescriber should order Liquor Strychninæ Hydrochloratis.

The last paper read was the fifth in a series of communications by Messrs. FARR and WRIGHT on the *Solvent Action of Alcohol of Different Degrees of Strength on Drugs* used in making Pharmacopœial Tinctures. The subject of this paper was tincture of henbane, and from the authors' results it appeared that perfect exhaustion of the alkaloid from the drug may be effected by the use of either strong or dilute alcohol. The authors seem to favor the use of a 50 per cent. menstruum on the ground that it is desirable to exclude chlorophyll from a tincture where this can be done without lessening the medical activity. They recommend that the tincture should be standardized to contain 0·01 per cent. of alkaloid.

The PRESIDENT then proceeded to make the presentation of books provided from the BELL and HILLS Fund. This is usually made to the library of an association of chemists and druggists meeting in the town visited by the Conference. In Cardiff, however, there is at present no such local association, but an arrangement has been made to place the books in the reference department of the free library of the town, where they will be always accessible to any person who wishes to consult them.

The Unofficial Formulary Committee having been thanked and reappointed, an invitation conveyed by Mr. PETER BOA and Mr. D. B. DOTT in cordial terms to the Conference to meet in Edinburgh next year was accepted. Mr. PAYNE broached the question as to the advisability of meeting in the same town as the British Association, and after some conversation gave notice of a motion that will raise the question formally at the next meeting of the Conference.

The following gentlemen were then elected officers of the Conference for the ensuing year, after a protest from Mr. PAYNE that Ireland was not represented on the Executive, and an inquiry, by Mr. A. H. Mason, answered in the negative, as to whether Mr. MARTINDALE could not be persuaded to serve a second year:

President—E. C. C. Stanford, F.I.C., F.C.S., Dalmuir.

Vice-Presidents—M. Carteighe, London; W. Gilmour, Edinburgh; Dr. Thresh, Chelmsford; and J. R. Young, Edinburgh.

Treasurer—R. H. Davies, London.

Hon. General Secretaries—W. A. H. Naylor, London; and F. Ransom, Hitchin.

Members of Committee—D. B. Dott, Edinburgh; A. W. Gerrard, London; Professor Green, London; Alfred Coleman, Cardiff; J. Hodgkin, London;

E. M. Holmes, London; W. Kirkby, Manchester; J. Munday, Cardiff; and J. L. Ewing, Edinburgh.

Auditors—D. Anthony, Cardiff, and Thomas Thompson, Edinburgh.

Hon. Local Secretaries—Peter Boa and Claude F. Henry, Edinburgh.

Hearty thanks were then voted to the local members, and especially to Messrs. COLEMAN, MUNDAY, YORATH and ANTHONY, for making the arrangements necessary for the entertainment of the Conference; to the Mayor and Corporation of Cardiff for the use of the Town Hall Assembly Rooms for the reception, and to Principal V. JONES and the Council of the University College of South Wales for the use of the lecture theatre in which the meetings of the Conference were held. Lastly came the vote of thanks to the PRESIDENT, moved in happy terms by Mr. S. R. ATKINS and seconded by Mr. TYRER and adopted with an enthusiasm that must have convinced Mr. MARTINDALE of the general appreciation of the admirable manner he had fulfilled the duties of the chair.

After the conclusion of the business, a party, numbering about one hundred and fifty, were conveyed in brakes to Caerphilly Castle, where they were entertained to tea in the ancient banqueting hall by the Mayor of Cardiff, after which a lucid sketch of the history of the castle was given by Mr. ROBERT DRANE. The drive was through a beautiful district, but the enjoyment was again marred to some extent by the fall of several very heavy showers.

Thursday morning was fairly fine, and about one hundred and fifty of the members of the Conference and their friends met at the Great Western Station for the final excursion. The first stage was by the South Wales Railway *via* Newport and Chepstow to Lydney. Here vehicles were waiting, in which the party was driven through a beautiful country to the Speech House, in the Forest of Dean. An excellent luncheon having been disposed of, the opportunity was taken to thank the local committee of ladies and the managers of the excursion, and after a short interval the carriages were entered and a start was made for Symon's Yat. By this time, however, rain had again set in, and continued almost without cessation to the end of the day. It did not, however, spoil all the pleasure, and the wonderful view of the winding Wye from the top of the Yat, although obscured to some extent, won the admiration of all who saw it for the first time. Tea was served in the Rock Lea House, and that over, a special train conveyed the party past Monmouth, Tintern and Chepstow, back to Cardiff, which was reached soon after half-past eight.—*Phar. Jour. and Trans., August 22.*

EDITORIALS.

Female Pharmacists in Russia.—The State Council of Russia has decided to admit females to the study of pharmacy at all Russian universities; they must be not less than 16, or more than 40 years of age, and after three years' study may present themselves for the final examinations, the same as the male candidates.

So-called Eucalyptus Honey.—The history of the alleged discovery, in Tasmania, of honey charged with eucalyptol, was printed in this Journal for September, 1887, p. 472; and in the May number, 1889, p. 264, the fraudulent character of this product was exposed in an article taken from the Australian

Journal of Pharmacy. The Pharmaceutical Journal and Transactions of December 6, 1890, contains a paper by T. P. Anderson Stuart, M.D., Professor in the University of Sydney, in which it is shown that no such honey is known in any part of Australia or Tasmania; that the stingless black bee of Australia, Trigona carbonaria, *Smith*, builds its nest in a hollow tree, the hive rarely exceeding one foot cube; that the flowers of the eucalypts have not the odor of eucalyptus oil, which is procured from the leaves; and that the honey, even if taken from hives located in eucalyptus trees, never contains any appreciable amount of eucalyptol. During the discussion before the Pharmaceutical Society in London, following the reading of Dr. Stuart's paper, different samples of honey were exhibited, which were stated to have been gathered in eucalyptus districts, and of which none had the odor of eucalyptus oil; such true eucalyptus honey could not have the properties of eucalyptol, and whether its properties differed from those of good European honey had not been determined. More recently, the curator of the Technological Museum at Sydney, J. H. Maiden, has published a card (*The Chemist and Druggist*, July 11, page 60), declaring it as his intent, not to let the matter rest unsettled, and making the following offer: "Eucalyptus honey is said to contain 15 to 17 per cent. of eucalyptol. I will pay £5 to the Benevolent Fund of the Pharmaceutical Society if a sample of Australian natural eucalyptus honey can be produced containing only 5 per cent. even of eucalyptol. The only conditions I impose are that I receive herbarium specimens of the eucalyptus concerned, and be given the precise locality; and I will undertake that I (or a deputy) will visit the spot and examine the evidence in any part of Australia. . . . If I am proved to be wrong, I will acknowledge it like a man. . . . At present I pronounce this eucalyptus-honey romance to be one of the most impudent impositions on the credulity of medical men and pharmacists that I have heard of in connection with Australian products."

As far as we have been able to ascertain, the eucalyptus honey referred to is but little known in the United States.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Chemistry of the Carbon Compounds, or Organic Chemistry. By Prof. Victor von Richter, University of Breslau. Authorized translation by Edgar F. Smith, Prof. of Chemistry, University of Pennsylvania. Second American edition from the sixth German edition. With illustrations. Philadelphia: P. Blakiston, Son & Co. 1891. 12mo. Pp. 1040.

An excellent work is here presented to the student of organic chemistry, beginning with the scope of that discipline, the various methods of organic analysis, the chemical structure and the physical properties of the carbon compounds. The special part considers the various compounds arranged in two classes, the derivatives of methane or fatty compounds, and the derivatives of benzene or aromatic compounds. The subdivisions and grouping in both classes are in accordance with the most modern views of theoretical composition, and aid very materially in intelligently comprehending the chemical relations of the numerous compounds; theory and fact are blended together harmoniously and present to the student all that is essential to knowledge, while special details of methods and properties are frequently indicated by

references to prominent journals. Concise, but clear, in all its statements, whether they refer to practice or theory, the book is admirably adapted for the systematic study of the carbon compounds; the beginner finds an outline of the science indicated in the text by large type, and the advanced student is led to the study of other equally important matter through numerous paragraphs printed with smaller type. Thus the work becomes also a volume of reference for theoretical chemistry in general, and for most organic compounds in special. Moreover, the numerous processes and methods, tersely described, make the work useful as a practical guide in the laboratory. The external appearance is in keeping with the excellencies of the text.

A Short Manual of Analytical Chemistry, qualitative and quantitative—inorganic and organic. Arranged on the principle of the course of instruction given at the South London School of Pharmacy. By John Muter, M.D., Ph.D., F.R.S.E., etc. First American from the fourth English edition, edited by Claude C. Hamilton, M.D., Ph.G., etc. Philadelphia: P. Blakiston, Son & Co. 1891. 8vo. Pp. xii and 205.

Part I of this work, devoted to qualitative analysis, opens with a chapter on chemical processes, and then proceeds to the detection of the metals, which are arranged in groups, beginning with those precipitated from their solutions with hydrochloric acid, and terminating with the alkalies. The acidulous radicals and their separation are considered in Chapter III, and this is followed by the qualitative determination of simple salts and of mixtures of salts. Chapter V contains schemes for the systematic detection of alkaloids, glucosides and various other medicinal organic bodies, also for the isolation of poisons in mixtures.

In Part II, weighing, measuring and specific gravity are first discussed, including the methods for determining vapor densities. This is followed by volumetric analysis, the use of the nitrometer, and colorimetric analysis; then by the gravimetric determination of metals and acids; by ultimate organic analysis; by the analysis of water, air and certain articles of food; by special processes for drugs, urine and urinary calculi; and finally, by a chapter on the analysis of gases, by the polariscope and on spectrum analysis.

It will be observed that the scope of the work is a very extensive one for the limited space, which renders briefness necessary; but the methods and results are clearly described, and the arrangement of the extensive material is quite practical, as might be expected from the large experience of the author. The American editor, who is professor of analytical chemistry in the University Medical College and the Kansas City College of Pharmacy, has adapted the work to the requirements of the United States Pharmacopœia, enlarged the chapter on urine analysis, and made some other acceptable changes and additions. The proofreading has been carefully done, but very few typographical errors having been noticed by us. In a few instances, it would seem to be desirable for the complete characterization of certain compounds, to somewhat extend the descriptions; for instance, the solubility of jalapin in alkalies is mentioned, but it has been omitted to state that such a solution is not precipitated by acids; the partial solubility of podophyllin in boiling water, and the influence of light upon santonin have not been mentioned.

We regard the work as a very useful one, and as being well adapted for

analytical work by students under supervision of an experienced teacher, and for a trustworthy guide to those who are not novices in chemical analysis.

Experiments arranged for Students in General Chemistry. By Edgar F. Smith, Professor of Chemistry, University of Pennsylvania, Philadelphia, and Harry F. Keller, Professor of Chemistry, Michigan Mining School, Houghton. Second edition, enlarged, with 37 illustrations. Philadelphia: P. Blakiston, Son & Co. 1891. 8 vo. Pp. 56. Interleaved for notes; cloth, 60 cts.

Intended for beginners in chemistry, this little work aims at inculcating habits of correct observation, by means of experiments, and by directing attention to phenomena and results in such a manner, that the student will be required to note properties, alterations and distinctions in the materials placed in his hands. The experiments are judiciously arranged, beginning with such relating to apparatus and manipulations, and followed by others calculated to illustrate general principles of chemistry, after which the various non-metallic and metallic elements receive attention.

Tables for Doctor and Druggist. Compiled by Eli H. Long, M.D., Professor of Materia Medica, Buffalo College of Pharmacy, etc. Detroit: George S. Davis, 1891. 8vo. Pp. 133. Price, $2.

The following tables are contained in this book: (1) Table of solubilities, giving the behavior of water and alcohol, at 15° and 100° C., and of other solvents upon medicinal and other chemicals and upon certain plant-products. Among the latter are ammoniac, myrrh, guarana, etc., but not opium, asafœtida and gamboge. The statements have been compiled with care, and but few inaccuracies have been noticed; thus, ammoniac is not "insoluble" in water, a portion of its gum yielding a perfect solution; guarana is only partly soluble in alcohol, the vegetable tissues being insoluble. The word hæmatoxylon should be corrected to hæmatoxylin.

(2) Table of reactions and incompatibles; included are also a number of crude vegetable drugs, of which the prominent constituents are given, thus furnishing a guide to their behavior under certain conditions.

(3) Table of doses and uses; the doses are indicated in the metric system, and in apothecaries' weight and measure; of many of the Latin terms the genitive case is also noted. The list is very complete, and comprises a large number of extra-pharmacopœial drugs.

(4) Table of specific gravities; and (5) table of poisons and antidotes. The latter gives the toxic dose, the action of the drug, the prominent symptoms, and the antidotes or treatment.

The usefulness of the book is readily seen from the brief account of the contents given above. It has been prepared with care and good judgment, and the typographical arrangement and display facilitates its use.

OBITUARY.

Jules Leon Augustin Creuse, Ph. G., died in Paris, France, August 13, 1891, in the 56th year of his age. Born and educated in Paris, he came to the United States when he was 21 years of age, and in 1861 graduated from the New York College of Pharmacy. About twenty years ago he contributed a number of interesting papers to the American Journal of Pharmacy, and to the publications issued by the American Pharmaceutical Association, and by the Alumni

of the New York College of Pharmacy. From 1869 to 1884 he was connected with the *Druggists' Circular*, his editorial labors marked with good judgment and high ability. Owing to rheumatic affections having troubled him for some years, he withdrew from the editorial chair, and took up his residence in his native city, where his widow and his mother survive him.

Notice of the death of the following graduates of the Philadelphia College of Pharmacy has been received.

Walter E. Bibby, class 1875, died in this city August 29th last, the result of cocaine poisoning. He was born in Ripley, O., and some years after graduating in pharmacy studied medicine, and became a practicing physician in this city. He contributed several papers to this Journal in 1875 and 1876.

Emery G. Bissell, class 1877, died in Waterville, N. Y., September 2, 1891, after a long illness, from tumor on the brain, aged 41 years. He was born in Waterville, and was engaged there in the drug business in partnership with his father and brother. A widow and two children survive him; also his parents and four brothers. His graduating thesis on hop culture in New York and on some constituents of hops was published in this Journal in 1877. The deceased was a member of the New York State and of the American Pharmaceutical Associations, and took much interest in the advancement of pharmacy; at his home he was held in high esteem as an honorable and useful citizen.

Chas. W. S. Edenborn, class 1889, died suddenly at his father's residence in this city, August 24th, last.

Chas. B. Evans, class 1872, died suddenly at Memphis, Tenn., June 30, 1891. He was a native of Philadelphia, where he learned the drug business, and for the last few years had been clerking at Augusta, Ga.

Wesley J. Hibberd, class 1888, died at his father's residence at Bridgeport, Pa., September 5th last, aged 26 years. Bright's disease was the cause of his death.

Frank E. Miller, class 1873, died at St. Paul, Minn., September 6, 1891. He was born at Ankum, Hanover, January 19, 1848, and in the following year came with his parents to St. Paul, Minn., where he was educated and learned the drug business in his father's pharmacy, and where, after graduation, he spent the remainder of his life. His thesis on Anemone Ludoviciana was published in the Amer. Jour. Pharm., 1873, p. 298.

Talbot C. Murray, class 1863, died at Washington, D. C., September 18th, last. He was born in Philadelphia, and for a number of years had been in the employ of the Government.

Hans H. Sinne, class 1885, died at his residence in Trenton, N. J., of consumption, August 8, 1891, aged 28 years. He was a native of Prussia, learned the drug business in Philadelphia, after graduation in pharmacy studied medicine, and for several years was proprietor of the drug store at Eleventh and Buttonwood Streets. Afterwards he removed to Trenton, where he devoted himself to the practice of medicine.

James Wilson, class 1860, died July 10, 1891, at York, Pa., where he was born 53 years ago. For a number of years he had been in business in Philadelphia, at Sixth Street and Germantown Avenue, under the firm name of Curran & Wilson, and later as Wilson & Brother.